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No. 3

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of
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*A Monthly Journal Devoted to the Advancement of the Sciences
of Orthodontia, Oral Surgery, and Dental and Oral Radiography*

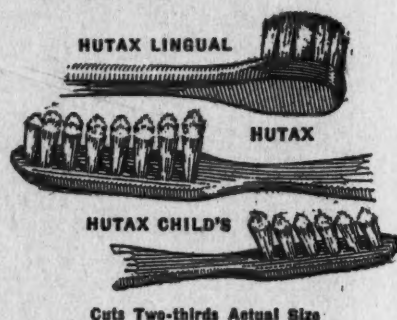
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VOL. VII

ST. LOUIS, MARCH, 1921

No. 3

ORIGINAL ARTICLES

UNUSUAL CASES IN ORTHODONTIA*

BY ADELBERT FERNALD, D.M.D., BOSTON, MASS.

MR. PRESIDENT and members of the Dewey Alumni Society, it is a pleasure to be with you today. When I read President Weeks' letter, and realized what it all meant, I knew it would be my fault, if I did not gain a great deal by attending these meetings.

The title of my paper "Unusual Cases in Orthodontia" may be a misnomer, but in my practice, some of the cases I will show you, certainly are unusual.

In treating extreme cases of open bite, as well as distoclusions and mesio-clusions, I often wish I could get some measurement that would be reliable, to show how much the mandible and the teeth have been brought forward or forced back, and which has moved more. First, I will show some instruments I have designed and used for several years, and would find it hard to get along without. I realize that any measurements which are not accurate do not have much scientific value. The difficulty is, in finding a fixed point to measure from. I have tried the bridge of the nose and external meatus of the ears, which gave three fixed points. This instrument had some good features, but children object to having apparatus adjusted in the ears.

The pelvimeter, as you know, is an instrument, used by surgeons to measure the pelvis and other parts of the body, to which I have attached a chin-piece, to measure from chin to back of head. I have also added a coil spring from each arm, so that when measurements are taken, the same pressure will be applied at each measurement. I am aware that some will say these measurements are of no use, that as a child's head develops, the bones growing larger, the child gaining or losing in weight, any measurements one could take would not be accurate, but even so, I have had the pleasure of making the instruments, and no harm has been done, and I intend to keep on experimenting.

The little measuring appliance is attached to upper first or second molar, and

*Read before the Alumni Society of the Dewey School of Orthodontia, April 1-3, 1920.

chin-piece adjusted to the chin, (chin-piece sliding backward or forward on scale) is locked in place and measurement recorded. After treatment another measurement is taken. If the upper molar has not been moved, the measurement will be fairly accurate. By removing the chin-piece and locking movable point to teeth either above or below, the movement of the anterior teeth can be measured before and again after treatment.

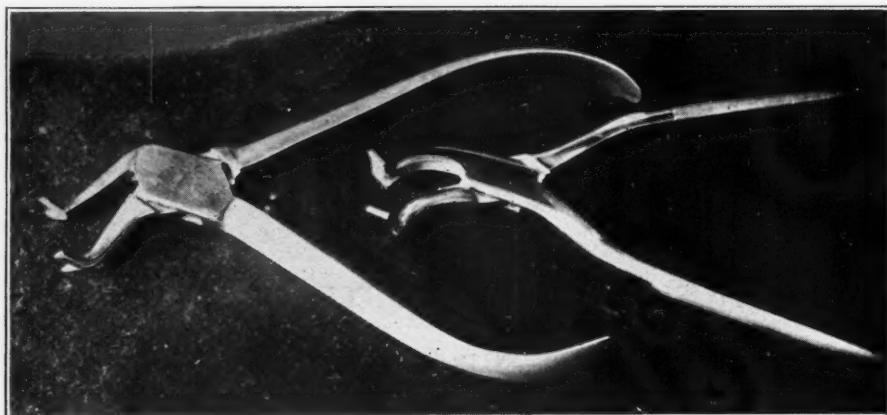


Fig. 1.



Fig. 2.

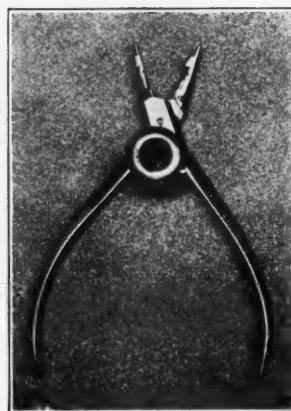


Fig. 3.

The different forms of the lingual arches have always appealed to me and in selected cases the soldered arches, especially in cases where children fool with appliances. For years I have used these little pliers, (Fig. 1) which I have found extremely useful for bending the arch and retainers in the mouth. The handle should have an offset from the point so as not to come in contact with

the anterior teeth, and points made thinner. The jewelers' pliers for adjusting spectacles to the bridge of the nose, I find useful in making arches and retainers. (Fig. 2.) These combination pliers, (Fig. 3.) taking the place of five different tools, are very useful in many ways.

In describing treatment of cases I will be brief. In most of these mutilated cases where a premolar or even a lateral is lost, I have preferred to close up the space instead of replacing the missing tooth.

CASE 1.—A boy twelve years of age, class one. (Fig. 4.) Maxillary teeth normal in size, centrals and laterals crowded. Mandibular right second premolar

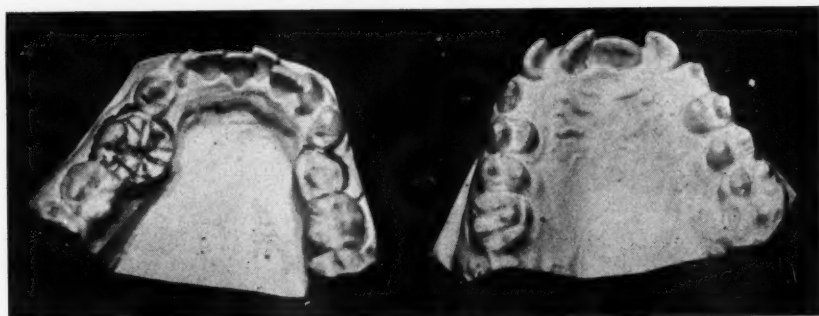


Fig. 4.—Case 1.



Fig. 5.—Case 2.



Fig. 6.—Case 2.

one-third too large, second mandibular premolar enormous, having fourteen cusps, all other teeth normal in size. Radiograms show no other teeth present. The boy says "they are good chewers," so I will retain them. Arches were expanded, and anterior teeth moved into normal occlusion.

CASE 2.—Girl sixteen years old, (Figs. 5-6) mutilated case of distocclusion. Maxillary right and left first molars missing as well as mandibular left first molar. Maxillary second and first premolars moved back, one after the other, closing the space of missing molars, then maxillary canines were carried back making room to expand laterals, so two centrals could be retracted. Intermaxillary elastic was worn until a good occlusion established. This case has been

easy to retain, and a wonderful improvement was made in the personal appearance of the patient.

CASE 3.—Class 2. (Fig. 7.) A girl twelve years old. Unusual in having no mandibular laterals, the radiogram showing none present and no history of any. The upper lip was full. The patient lived nearly one hundred miles away, and I thought that I could simplify the treatment of this case by extracting the maxillary right and left first premolars. The two canines slanted

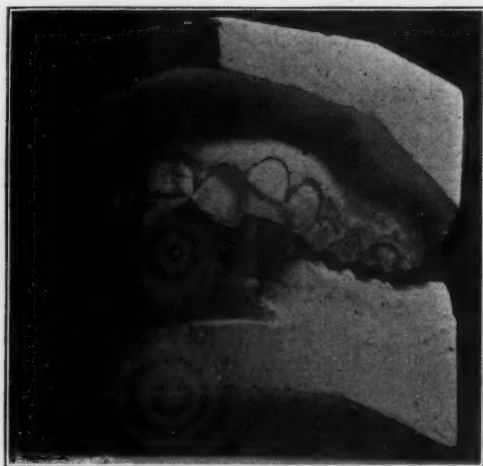


Fig. 7.—Case 3.



Fig. 8.—Case 4.



Fig. 9.—Case 5.

forward to a great extent, and they were pulled back with intermaxillary elastics until they touched the second premolars. This has given me room to tip the centrals and laterals back nearer to normal. The patient is wearing intermaxillary elastics to bring mandibular teeth forward. The appearance of the mouth has been greatly improved, although the case is not finished.

CASE 4.—Class 1. (Fig. 8.) Girl 14 years old, with mandibular right second premolar missing, space nearly closed. Radiogram showed premolar embedded in lower part of jaw, crown tipped toward apex of first molar root. Have just started treatment on this case.

CASE 5.—(Fig. 9.) Distocclusion. Three of the family had the same V-shaped arch. This patient is a young man, eighteen years old. Maxillary right

second premolar missing, typical V-shaped arch, mandibular centrals and laterals crowded. Arch was expanded in canine and premolar region and maxillary centrals slowly rotated in place by a spring. Maxillary right first premolar moved back to close up space of missing second premolar.

The sister of preceding patient has also distoclusion. Twenty-eight years old. (Fig. 10.) Both maxillary right and left first molars were extracted, as they were badly broken down and abscessed. Arch expanded, canines and premolars on each side were forced back to partly close space of missing first molars, the wisdom teeth coming forward to close the remaining space, without any force



Fig. 10.—Case 5A.



Fig. 11.—Case 6.

being applied to them. Centrals very slowly rotated by a spring appliance. The mandibular premolars on each side are missing. Centrals and laterals crowded. The mandibular premolar will be replaced. At the time of writing, these two cases are not completed.

CASE 6.—Class 1. (Fig. 11.) A young lady twenty-five years old split the mandibular left first molar so it had to be removed. The radiogram showing the third molar present. After waiting seven years, the radiogram shows the third molar in the same position. Suggested moving second molar forward to see if the third molar would erupt. First and second premolars were banded together for reinforced anchorage, expecting it would also be necessary to use

canine, with a tube soldered to buccal surface, second molar banded with long tube soldered parallel to tube on premolar. A bar was placed through each tube with nut on one end, patient wearing elastic bands over ends of each tube. As fast as the second molar moved forward the nut was screwed up and the surplus wire cut off. By the time the space was half closed, I was delighted to find the third molar erupting close to second molar. By the time the space was all closed the third molar was fully erupted, with no space between it and the second molar. From the time the appliance was adjusted until it was removed was nearly one year and a half, the patient being seen every month or two and at this time is thirty-two years old.

The premolars drifted back slightly relieving the crowded condition in the

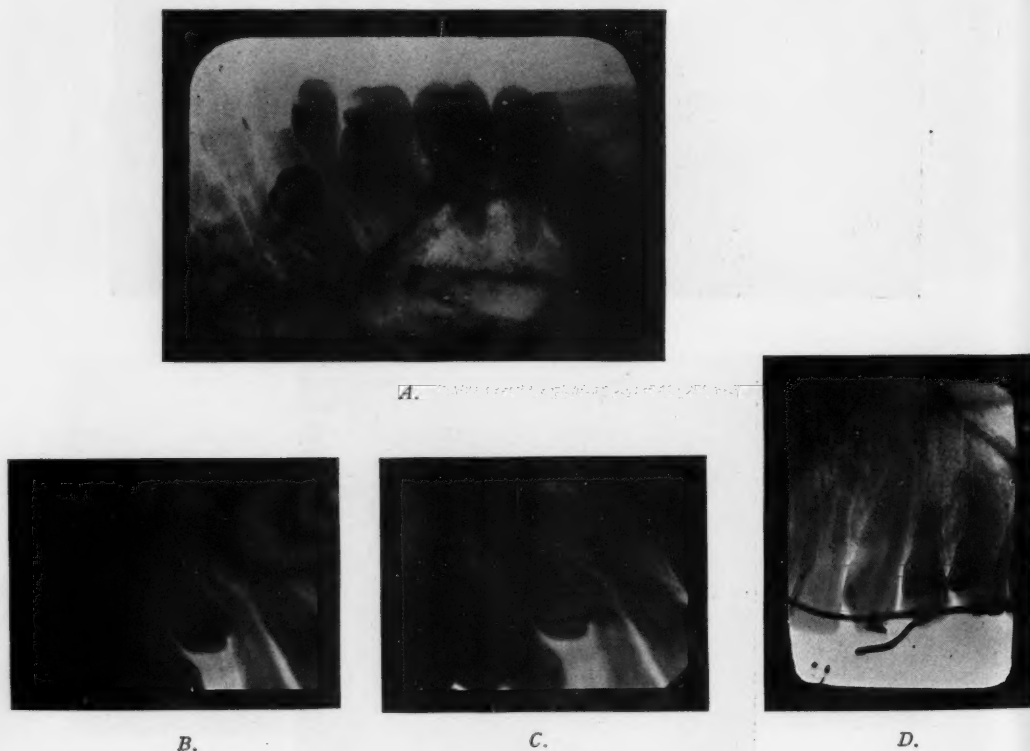


Fig. 12.—Case 8.

central and lateral region. The second molar has been moved forward and only slightly tipped. No retainer was adjusted, the third molar acting as such.

CASE 7.—Neutroclusion. A girl fourteen years old. Maxillary right deciduous molar roots retained, radiogram showing first premolar missing. Mandibular left second deciduous molar retained, but broken down, radiogram showing second premolar missing, roots were extracted. This case was treated same as last, posterior teeth were carried forward to close up space.

CASE 8.—Neutroclusion. (Fig. 12.) A young lady twenty-four years old. Maxillary right canine and deciduous first molar retained, radiogram showing first premolar and canine present, deciduous teeth were extracted exposing the first premolar, which has erupted. After eight months the canine showed no

signs of erupting, so gum and process was removed, crown of tooth exposed, hook attached to lingual side of crown. Tooth in seven months has been pulled into normal position.

CASE 9.—Neutroclusion. Girl fifteen years old, large tongue, spaces between anterior teeth above and below. Four deciduous canines retained in between premolars and laterals, with the four permanent canines erupted or erupting along side of deciduous canines. The maxillary canines erupted in the spaces between the laterals and deciduous canines. The patient having eight canine teeth present, the mandibular left deciduous molar still in place, as well as the maxillary left and right. Radiogram taken and all the deciduous teeth were removed. The two maxillary second premolars are coming into place, but only about half as large as they should be. At time of writing the spaces are practically all closed. I have in position a working retainer, consisting of soldered labial arches with loops on buccal sides. In treating this case I endeavored to



Fig. 13.—Case 10.

bring the premolars and molars forward to close up the spaces, so the second and third molars will erupt forward and retain the teeth.

CASE 10.—Mutilated case (Fig. 13) of neutroclusion. A young lady twenty-eight years old, with mouth full of deciduous teeth, mouth in bad shape, gums sore and inflamed. Patient was unable to masticate food properly. Radiogram shows that all four canines had not erupted as well as most of the premolars. At time of writing, all deciduous teeth had been extracted, except the two deciduous maxillary right and left canines, which will be. Inside of four weeks the mandibular right canine had erupted an eighth of an inch. Several of the premolars are coming. I will wait a while on this case to see what Nature will do, assisting where assistance seems necessary.

CASE 12.—A boy eighteen years old. (Figs. 14, 15, 16.) When the mouth is closed as far as possible, only the right second molars occlude, no other teeth in contact. I will call it a mutilated case of mesioclusion, infraversion. One brother and two sisters have the same type of occlusion, but to a lesser degree. By moving the mandibular right second molar forward I have been able to close the bite. The second molar on the left side did not meet by one eighth

of an inch. The maxillary right second premolar had been extracted by a Dentist, who thought to improve the case. Mandibular right second premolar and first molar, mandibular left first premolar and first molar are missing. By closing the bite, carrying the maxillary anterior teeth forward, and retracting the mandibular I will be able to get the anterior teeth somewhere near normal, in fact they now have an end-to-end bite. The missing teeth will be supplied so that instead of having one tooth to chew on he will have many. This case



Fig. 14.—Case 12.



Fig. 15.—Case 12.

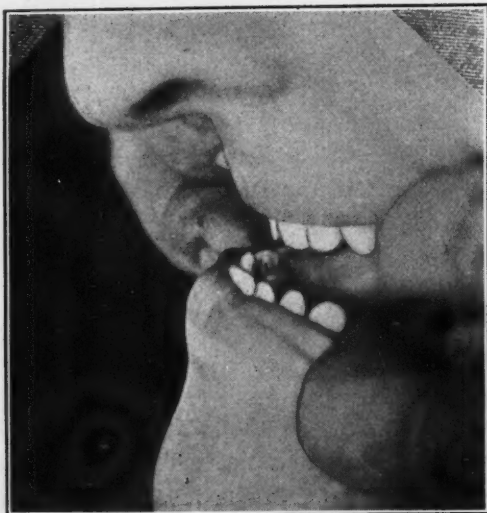


Fig. 16.—Case 12.

has been under treatment about one year. I would prefer to show finished cases, but as I am showing unusual ones, I am taking them in all stages.

CASE 13.—Class 1. (Figs. 17, 18.) A boy twelve years old. Mandibular arch crowded in central and lateral region, very large strong teeth. Maxillary left central had erupted outside arch three-eighths of an inch beyond the other central and lateral, the natural space being nearly closed. The maxillary left deciduous canine had been retained, the right lateral and first premolar in contact, upper right canine ready to erupt labially, in infraversion. The

radiogram showed the maxillary left canine to be impacted in the center of the arch at the apex of the two centrals, (Figs. 19, 20) with two supernumerary canines up side down, one above, and one below canine. The deciduous canine was removed, and one of the two supernumerary canines, arches were expanded until space had been obtained, to bring central back in normal position, expansion was carried on still further in the right canine region until canine had



Fig. 17.

Fig. 18.



Fig. 19.



Fig. 20.



Fig. 22.



Fig. 21.

erupted into near normal position. (Fig. 21.) The impacted canine was exposed by removing gum and process until it could be seen at apex of centrals. (Fig. 22.) A small hole was drilled in the tip and a thread cut, an iridioplatinum-screw turned into place, (Fig. 23) in about five months the canine was pulled down even with the mucous membrane. (Fig. 24.) At writing the canine



Fig. 23.



Fig. 24.

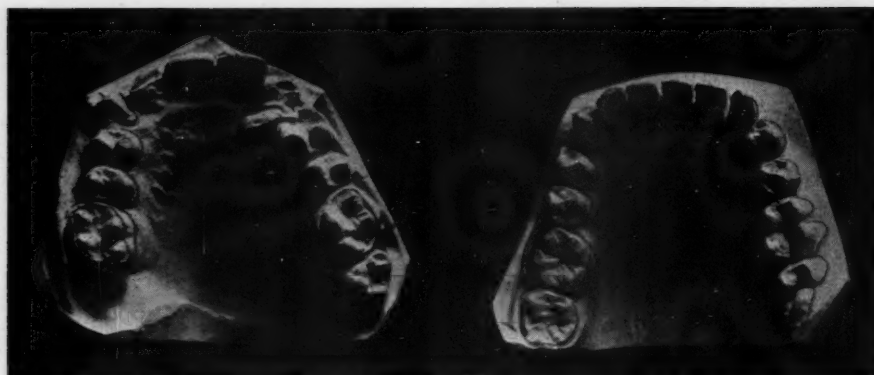


Fig. 25.



Fig. 26.

has been pulled down until three quarters of the crown is in sight, (Fig. 25) it being necessary now to expand the arch a little more before the tooth can be rotated into place. The other supernumerary canine being on upper side of this one, I did not think it wise to remove it at the time the other was, thinking that as the permanent canine came down the other would follow in the line of least resistance, and Fig. 26 shows that it has. Fig. 26 also shows that the

supernumerary will have to be removed, as it will be in the way of canines. Maxillary right second molar has not erupted but radiogram shows it coming. I hope by another year to have the pleasure of showing you this case completed. As this case had so many unusual features, it has been very interesting.



Fig. 27.



Fig. 28.



Fig. 29.



Fig. 30.



Fig. 31.

I have now on hand about twenty cases of impacted teeth, consisting of all canines and premolars.

CASE 14.—Class 2. (Figs. 27, 28, 29, 30.) Infraversion, a young lady seventeen years old, right and left second molars occluding. This is an unusual case in having the two maxillary centrals missing. Patient has suffered from

adenoids and enlarged tonsils, they were removed. Maxillary arch expanded and intermaxillary elastics were worn for nearly two years, and then discontinued. After the intermaxillary elastics had been discontinued for five months, the occlusion was found to have remained the same. The two laterals having a wide space between them were made into centrals by jacket porcelain crowns, which were made large enough to fill the space and act as retainer to hold canines out. As the color and shape blend so well with the other teeth, it has made a great improvement.

When one studies the occlusion of this case (Fig. 31) it does not require much imagination to see that the facial lines and contour would be even, regular and perhaps beautiful. It is a good specimen for us to take as a model to try and place every tooth in like position.

DISCUSSION

Dr. Martin Dewey, New York City.—It is difficult to discuss a paper when you cannot find fault with it. I want to compliment Dr. Fernald on the attitude he has taken toward these unusual cases. I notice a tendency on the part of many men who practice orthodontia to select their cases. We find some men are getting to the point where they say they will not take cases after a certain age because they do not want to deal with the difficult conditions. Dr. Fernald leans the other way and tries to see how many difficult cases he can find in the practice of orthodontics. I do not believe an orthodontist has a right to select his patients. It is a nice thing if you get all easy cases at six or seven years of age in which you can get ideal or normal results. There are men who will not take any other cases. The question arises, what are those people going to do who have unfortunate facial deformities and the malocclusions as shown in this paper? They are entitled to some consideration. As orthodontic specialists we are not living up to our ideals. We claim to have a certain fitness for treating these cases, and if we do not handle them, who is going to handle them? I know from a monetary standpoint these unusual or difficult cases cannot always pay a compensating fee. You may have to work along for four or five years on an individual case, but in the end, if you are satisfied with the results, you will feel that you have been amply paid in the satisfaction you have obtained. Of course, in these unusual cases you do get your pay in the satisfaction that you satisfy the patient. We find these patients are thankful; they appreciate what is done for them. In times past, I have treated several such cases, some of them unusual, such as the doctor has shown, with the idea of seeing what I could accomplish for these people. From a monetary standpoint, I did not make anything. However, I had the satisfaction of doing something for these patients for which they were very grateful. I think the orthodontist has no more right to select his patients than a surgeon has to select his cases. Some surgeons refuse to operate if there is great likelihood of the patient dying because they do not want the death charged to their operation. If the patient had ninety chances out of a hundred of dying, the surgeon should give him the advantage of the other 10 per cent that he has to survive the operation. To operate and do what can be done for the patient is the only proper way.

In the treatment of cases of malocclusion, if we cannot get ideal results, we should give to the patient what we can get in the way of improved masticating efficiency.

In regard to the instrument shown; instruments for measuring the face and movements of the teeth are desirable. As the essayist has stated, we would like to know in what direction and to what extent we move teeth in anterior or posterior occlusion cases. The instrument he has designed to clasp upon the upper molar and measure the movement of the development of the mandible and chin is as accurate as anything you can get.

He spoke of the frontal eminence and external meatus of the ear as fixed points. They are as fixed as you can get in the cranium, the least change being at the junction of the chondrocranium and the face. If you examine the maxillary bones, mandible and facial bones, in a

study of skulls, you will find these bones in different animals are more elastic than any bones in the chondrocranium. You must remember the cranium and face will grow in all directions. You may make measurements of the same individual at two different times and have them vary.

A few years ago I happened to have the pleasure of seeing an instrument Dr. Black designed for measuring the development of the palate and arches. At that time I was quite interested with Dr. Noyes in some work, and we studied the instrument together. I believe there was but one instrument made because Dr. Noyes could not get the same measurements twice in the same individual. He felt the anatomic conditions were such that it was impossible to start out with the idea of a measurement from the palate. I do not know whether Dr. Noyes has done anything with it since. These are some of the difficulties in measuring change and I believe one of the most satisfactory ways of measuring is by the plan which Major Eby and I worked out in taking an impression of the teeth and then inserting it in an impression of the face. We have the teeth in exactly the same anatomic position in the cast as in the face. We can measure from the ear, chin and nose and have a record of it. The same technic has been used by students in later years. The trouble is you have to make so many casts of patients. If you take an anterior or posterior occlusion case and make a facial cast with insert, before you begin treatment and then make a facial cast after treatment, you would have two exact facial casts with the dental apparatus occupying the same position in the casts as it occupied in the patient at that particular time. That is the object we had in view when we worked out that technic, which has lately been improved by Dr. Oliver, but on account of the time involved, I never have worked out a series of record casts that way. That would give an absolute record of all developments of the face in regard to the dental apparatus and would be more accurate than any measurements, because if a patient is fat at one time and in three months is thin you will have a variation in measurements. While we need measurements, the anatomical conditions are such as to make them only approximately, instead of scientifically, accurate.

The President.—Dr. Dewey brought out the point of selecting our cases. This tends to establish the fact that we have not enough orthodontists. If we had more orthodontists, we would not be so likely to select our cases.

Dr. C. C. Johnson, Memphis, Tenn.—I do not know that I have had many of these difficult cases to deal with, hence I do not feel competent to discuss this paper. I feel though, as Dr. Dewey suggested a moment ago, that we ought to take these cases and do what we can for them. If we do not obtain the ideal results that we want, we may get such results as are of real value to these patients and be a real help to them. We ought to do that. I believe we are shunning these cases too much. We are saying we cannot get ideal results later than fourteen years of age, and we do not want to take cases later. There are scores of cases that ought to be treated later than that in which treatment would doubtless bring about improved results to the patient.

I think these cases shown here today will spur a good many of us not to be chary about refusing some of them, especially those of impacted teeth. I think, as a general rule, orthodontists have shunned these cases of impacted teeth. Radiographs make these things apparent, and we should use them more and more. I think it is time for us to take hold of these more difficult cases and treat them thoroughly. We should not hesitate to treat these cases later in life and do what we can for them.

I have a case I began with a good deal of reluctance. The patient is twenty-three years of age. There is so much movement in two of the lateral incisors that I questioned the outcome very much, yet I am treating this case with a lingual arch, and 19-gauge wire, finger springs of 22-gauge, and it is moving just as nicely as can be. It seems to me, I am accomplishing results the same as I do with children nine or ten years of age. I say this by way of encouragement to others to take hold of these older cases. There are so many young people that can be treated, whom in the past I have been turning away, that I must confess I have been doing, for a great many years, what orthodontists have done all over the country. I did not feel as though I could afford to take these cases and fall down on them because my practice was not extensive as an orthodontist; therefore, I thought it better to take only

those cases in which I could accomplish results. Today I begin to feel different about it, and I think all of us should strive diligently to give service in these difficult cases.

Dr. Fernald, (closing the discussion).—I wish to thank you for your kindness in giving me so much time, and for the discussion of the paper.

To me these cases have been interesting. I told those patients in the beginning I could not get ideal results, nor did I think any man could. However, I have never seen a case that could not be improved mechanically or from some orthodontic standpoint. If these patients can pay a reasonable sum, and I can make their lives easier and more comfortable, I think I ought to do what I can for them.

At the Harvard Dental School I have requested them to give to my students all the freak cases they could. I have found them extremely interesting and for each one something can be done. The greatest handicap is we do not get them in time. Their mouths are mutilated and they are too far advanced in age, so that it makes it doubly hard for the operator and the patient.

ETIOLOGIC INFLUENCES OF DECIDUOUS AND ERUPTING PERMANENT TEETH WITH PRINCIPLES OF TREATMENT*

BY CALVIN S. CASE, M.D., D.D.S., CHICAGO, ILL.

ONE of the most prolific of the local causes of malocclusion arises through improper care and treatment of the deciduous teeth. A large proportion of the malocclusions which arise from this cause are due to the fact that parents and dentists do not appreciate the imperative importance of preserving the teeth of the temporary dentures up to the very moment when each succeeding permanent tooth is ready to erupt; and they also fail to understand the character of influences which are exerted by the premature loss of one or more of these teeth toward marring the positions and occlusion of the permanent teeth.

The errors of dentists in this field of their profession are so frequent and so serious it would seem that there is a thoughtless disregard of principles which are plainly shown in the natural physiologic processes of secondary dentition, and which no thinking mind can contemplate without amazement and admiration.

In view of the large amount of literature upon this subject, and the competent teaching in the various colleges, showing the importance of preserving the deciduous teeth, it would seem that we should be free from those conditions which frequently confront us, and which must be regarded as caused by a ruthless interference with one of nature's most important provisions.

The deciduous teeth are evidently for the purpose of affording means of mastication during the early years when the full-sized permanent teeth would be all out of proportion in size and appearance for the undeveloped jaws and features. They are there, also, for the purpose of giving nature an opportunity to develop and erupt the permanent teeth, and in bringing them forward in successive and systematic stages, timed according to the needs of general growth and use. They are, moreover, for the purpose of establishing occlusal relations of the permanent teeth and harmonious relations of the facial outlines.

At about five years of age, the first permanent molars commence to crowd their way into the arches between the bases of the deciduous arches on one side, and the rami and tuberosities on the other. Nature, apparently conscious of the forceful influences of this eruptive process toward an interstitial forward movement of the entire deciduous dentures, has provided the deciduous

*This article is revised from the Second of five chapters of Part II, entitled "Etiology of Malocclusion" in the forthcoming revision of "Dental Orthopedia" by Dr. Calvin S. Case. The first chapter entitled "Etiologic Principles of Malocclusion with Reference to Treatment," was published in the September number of Dental Items of Interest. The titles of the rest of these chapters, which we hope to publish in consecutive numbers in this JOURNAL are: "Laws of Biology, Regarded as Etiologic Factors in Malocclusion," "Heredity and Variation, Ethnologically Considered," and "Practical Application of Biological Laws."

molars with broad spreading roots so as to take a sufficiently firm and immovable hold of their surroundings to successfully combat this force, in the same way that will be found with the roots of trees which are subjected to the force of strong winds. Note also, how perfectly Nature under normal conditions has timed this eruptive stage to prevent that possibility which she so evidently fortifies herself against, and at the same time to take advantage of the general developing forces of eruption: Under the needs of increasing age for greater masticating facilities, she starts the eruption of the first permanent molars at a time when the strong phalanx of the deciduous denture is there, or should be there, to resist the forward pressure of these erupting teeth; nor does she commence it before there is nearly enough room by growth for those large teeth back of the temporary set; nor before the alveolar surroundings of the deciduous roots are developed to comparative stability; nor does she wait until the temporary molar roots have become weakened by resorption from the eruptive forces of the premolars.

What could be more prophetic than these provisional acts on the part of Nature in emphasizing the importance of preserving the natural relative position of the bases of the deciduous arches in order that the permanent molars which are destined to establish the occlusal relations of the adjoining permanent buccal teeth will not be allowed to drift forward of their natural positions, since it is upon the established position of the first permanent molars that the relative positions of adjoining buccal teeth are dependent, and also the final occlusion and dento-facial relation of all the teeth. From this we may draw a lesson of the importance of preserving these temporary piers to the future arches until the time of the eruption of their successors, because at whatever stage the arch is long deprived of their support, the permanent molars will surely tend to drift forward to fill the gaps, notwithstanding the restraining influences of perfect interdigitating occluding cusps.

Another of Nature's acts along this line is worthy of the deepest consideration, because it seems to be prophetic of the apparently recognized tendency of the permanent molars to drift forward, and of the importance of preventing it up to the last moment: In the typically normal processes of secondary dentition, when the second deciduous molars are thrown off, the second premolars are ready to prick through the overlying gum tissue, and soon take their places in preserving the integrity of the arch. This is another reason for the spreading of the deciduous roots in order that the resorptive forces of eruption may have an opportunity, without the necessity of extraction, to make a place beneath for the premolar crowns, and thus permit them to erupt as much as possible up to the last moment of their power to hold the required space open. Otherwise, as is frequently seen—especially on the lower—the second premolars are impacted in the dovetailing inclination of adjoining teeth, because of the premature extraction or loss by decay of the second deciduous molars. It may be that this is one reason why the second premolars are the only ones of the permanent dentures which occupy less space than the deciduous teeth that precede them in order, perhaps, that they may have a little better chance to get into place before the drifting tendencies of the adjoining teeth can shut them out.

MALERUPTION OF LABIAL TEETH

From five to six years of age under normal processes, the arches commence to expand in the incisal area in coordination with the erupting forces, and from six to seven years of age, the roots of the temporary central incisors are so completely resorbed that the crowns fall out, or are forced out by the erupting permanent centrals. As these teeth prick through the gums, the cutting edges are commonly in front of the deciduous line, and are not uncommonly malturned. Their disto-mesial widths are so much greater than the deciduous centrals, that notwithstanding the expansion of the arches, there is usually not sufficient room between the deciduous laterals for their perfect alignment at this time. This has frequently led to the premature extraction of the deciduous laterals under the false impression that they were causing a permanent irregularity of the centrals. Whereas, in this very act, one of the important physiologic forces of Nature—the eruptive force—for the expansion of the arches is stopped. The forces of growth are far greater than we are accustomed to imagine; neither can it be appreciated fully, unless one has observed the power which the growth of the roots of trees exert which extend under strongly imbedded cement sidewalks, and which will often break the cement blocks and raise them several inches. With the extraction of the deciduous laterals, and the growth of the arch inhibited, there is soon found to be far less than sufficient room for the permanent laterals, and this leads to the premature extraction also, of the deciduous cuspids, followed by an alignment of the laterals which partially fill the cuspid spaces. Soon after this, or at about eight or nine years of age, the first upper premolars erupt, taking the places of the first deciduous molars. If the deciduous cuspids are not there, they naturally drift forward to partially fill the distal portion of the cuspid spaces, with the tendency also, for the teeth back of these to drift forward, so that when it is time for the cuspids to erupt, there being no room, or not sufficient room for them, they are obliged to force their way through the gums above their proper places, where they have often been regarded by many ignorant people as unnatural “tusks,” and have frequently been wrongfully extracted by dentists as the shortest if not the best means of correcting a deforming irregularity which has seemed to them impossible to correct properly in any other way.

Next in importance to the preservation of the deciduous second molars is the retention of the deciduous cuspids up to the last moment of their usefulness, whatever the apparent irregularity of the incisors; and while the permanent cuspids are very much wider than the space occupied by the precuspids, their wedge-like form impelled by the forces of eruption and natural provisional enlargement of the jaws, will usually enable them to take their places in normal alignment.

Another cause of the maleruption of cuspids is the premature loss of the first or second deciduous molars, which not only inhibits the growth development of the arch in that area, but permits a mesial movement of the first permanent molars which are forced forward by the oncoming erupting second molars. The premolars having also been forced to a mesial malposition, the

cuspid are forced to erupt out of alignment; especially if the deciduous cuspid have been prematurely extracted as frequently occurs in this condition, to give room for the eruption of the premolars.

The maleruption of lower cuspid is not so frequent as the upper cuspid. One of the reasons for this is: the lower permanent cuspid erupt before the first premolars, and consequently are not so liable to be interfered with. However, if the first molars are forced forward of their normal positions by the erupting and fixed mesial malposition of the second permanent molars, the cuspid are the ones which are forced out of alignment, whatever their position or stage of eruption. One can see by the many causes, direct and indirect which so frequently arise, why it is that the irregularity that is characterized by maleruption of cuspid, is one of the most common of all the malocclusions.

By far the larger proportion of temporary dentures are in normal occlusion and in correct dento-facial relations according to age and type, because that is the dominant type toward which the natural biological forces tend. And were it not for maltreatments and certain local and constitutional causes, there would be a far greater number of cases than at present, that would attain to normal occlusion of the teeth.

THUMB-SUCKING

The one cause which most often affects the normal relations of the deciduous dentures is the habit of thumb-sucking, which if allowed to continue into the early years of secondary dentition, will frequently produce all the dento-facial characteristics of an upper protrusion, but with no effect upon the disto-mesial relations of the buccal teeth, except to narrow the arches.

The *modus operandi* of the cause, its correction, and final treatment of the resultant malocclusion, will be found in the Practical Treatment of Division 1, Class I of "Dental Orthopedia."

INFLUENCES OF HEREDITY UPON DECIDUOUS DENTURES

In regard to the malocclusions which arise from heredity, from the simplest to the most pronounced dento-facial deformities, it is somewhat rare that the deciduous dentures and jaws indicate in an appreciable degree the condition which is destined to affect the permanent teeth and more mature jaws. This is because inherited physical dental malformations rarely commence to develop before the beginning of secondary dentition, nor are they often sufficiently pronounced to become apparent before the period of adolescence.

While there are exceptions to this rule, which is illustrated by Fig. 1, showing the plaster models of the deciduous and the permanent dentures of a Class II case at five and eleven years of age, *it is nevertheless true that early interference with the temporary dentures, such as expanding the arches, or the disto-mesial shifting of occlusal relations, is rarely advisable*, unless one is sure that the threatened condition has arisen from some definite local cause which the natural physiologic processes of nature will not correct. If teeth are prematurely lost, threatening maleruption or crowded malalignments, the areas

should be properly expanded and retained for the free eruption of the succeeding teeth. But under other circumstances where the erupting permanent teeth do not seem to have sufficient room and are forced into overlapping malalignments—a condition quite common with the lower incisors—it should be remembered that this is the only way in which nature is enabled to get those large teeth into the small and as yet undeveloped jaws which she is rapidly enlarging by interstitial growth for that purpose. If left to herself as she has been during all past ages when the same character of activities has repeatedly presented itself with results that were nearly if not quite invariably normal, there is no reason to believe that the same results would not now obtain without artificial interference. Besides, anyone of long experience has seen any number of these decided cases of overlapping malalignments of the erupting permanent teeth fully right themselves through natural forces alone.

It is therefore not always necessary or advisable to attempt any artificial preparation for the eruption of the permanent teeth; neither is it always advisable to begin at a very early age the regulation of children's permanent teeth, ex-



Fig. 1.

cept in those cases in which the effects of a local cause still remain, that cannot be corrected by natural forces.

It may be that the habit of thumb-sucking has narrowed the arches and protruded the upper incisal area and retruded the lower, or that the injudicious extraction or premature loss of the deciduous teeth has inhibited the growth development, and contracted the spaces required for the aligned eruption of the permanent teeth, or it may be that it is one of the many threatening malocclusions which arise from adenoids or nasal stenosis. Under such conditions, the early regulation of children's teeth is always admissible and advisable, and should be accomplished with the most delicately constructed appliances for both movement and retention. Furthermore, there should be a definite understanding with the parents that the operation is intended to place only the erupted teeth in corrected positions, for the purpose of permitting the free eruption of the remaining permanent teeth.

One of the greatest objections to the early regulation of children's teeth, is that we usually have them on our hands up to and through the eruption of the second molars; while the little ones up to nine or ten years of age could be running free and building up stable conditions of future health, and while,

moreover, the operation in many instances could be far more easily accomplished for everyone concerned by commencing after the eruption of the premolars—except of course in those cases where simple demands are imperative.

Another phase of this branch should not be forgotten: It has reference to the early disto-mesial malrelation of the first permanent molars whose correction must be determined, as before explained, by the character of the cause. If seen to be purely local, correct by all means, but do not be in haste to correct if there is any doubt that the cause may be an inherited protrusion, upper or lower.

A LOCAL CAUSE OF PROTRUSIONS

Before leaving the subject of secondary dentition, one of its greatest lessons cannot be too often repeated. This relates to that large majority whose permanent teeth are, or would have been, normal in occlusion and dento-facial relations in all instances, had the deciduous teeth been preserved, or retained according to nature's requirements. With these naturally normal conditions, if the loss of deciduous teeth has permitted the permanent buccal teeth to drift forward, ever so slightly, from an otherwise normal dental and facial relation in the arch, and the front teeth then erupt in alignment, *an abnormal protrusion of the facial outlines will be exactly in proportion to this movement*. If the extent of this mesial movement is sufficient to carry the crests of the cusps in front of those of the occluding teeth, a full mesial malinterdigitation of the upper cusps is inevitable. This shows how from premature extraction, or unnecessary loss of deciduous teeth alone, protrusion of the permanent teeth may arise, and though in amount it but slightly changes the facial contour, it may be sufficient to mar the expression of an entire physiognomy. When this occurs with both upper and lower dentures, as at times it no doubt does—all of the teeth having been forced forward of their normal position, and with a possible preservation of normal occlusion and alignment—it is a most unfortunate affair, because people in general, and among them dentists of renowned ability in orthodontia, seeing these perfect conditions of normal occlusion, interpret the facial imperfections which have resulted from this local cause, as inherent, or one intended by nature, and as perfect as it is possible for that individual.

We hardly imagine that in the many faces we meet, there has occurred during their childhood days a thoughtless or ignorant disregard of important principles in the treatment of the deciduous teeth, which has resulted in an unnatural and unnecessary protrusion of the permanent teeth, slight or great, over the upper or entire dento-facial area, characterizing the features, producing unesthetic expressions, and marring those perfect facial outlines which nature would have produced had she been permitted, or aided in having her way.

COMPARISON OF CHILDHOOD AND ADULT PHYSIOGNOMIES

The common normal peculiarity of childhood physiognomies, between the ages from six to twelve, is that of a slight protrusion of the upper and lower lips in relation to the other undeveloped features. By association, we intuitively

tively and unconsciously accept this appearance in late childhood and early youthhood without a thought of facial imperfection. And yet were we to analyze the facial outlines of these young people from the artistic viewpoint of the adult perfect outlines, we would find that a large proportion are similar to that which if seen in adult life would be truthfully denominated bimaxillary protrusion.

This is due to the fact that the teeth are the only parts of the body which do not grow larger than their first formations; and therefore during the development and eruption of the adult sized permanent teeth in the small jaws of childhood, where they are crowded in one upon the other, in their different stages of development, they necessarily expand the dental and alveolar arches prematurely, during the stage of secondary dentition; and as the entire maxillary and other facial bones do not keep pace with this rapid development, the lips are unesthetically, though naturally, forced forward in their outlines, all of which the ultimate growth of other parts finally harmonizes.

By continued observation of the development of childhood and adolescent features, one will frequently see, even as late as twelve years of age, prominent mouths and apparent receding chins, that at seventeen or eighteen years of age will entirely disappear. This goes to prove that which the author has endeavored to emphasize in other chapters, that the bones which characterize physiognomies do not always begin to show at twelve years of age that which is destined by the dominant strains of heredity to characterize the features during later adolescence.

The author remembers a mate of his school days who at twelve years of age was smaller than the other boys, with effeminate features and small nose like his mother's, but who at twenty years of age was six feet tall with large angular strong features and prominent Roman nose like his father's more dominant type.

THE RELATION OF THE GENERAL PRACTITIONER TO THE SPECIALIST IN DENTISTRY*

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AT perhaps no time in the world's history have there been so many and so important changes as are taking place at the present time. At no time has it been so necessary for men almost daily to readjust their ideas and to bring them into harmony with those changing and changed conditions. The world has grown very much smaller than it was even twenty-five or thirty years ago. What with wireless telegraphy, Atlantic cables, wireless telephones, and the great advances that have taken place in science and practice, knowledge has increased to such an astonishing extent that no man can hope to be even fairly conversant with all the current thought of the day. While the world has grown smaller, knowledge has increased. The research work of the past few years has resulted in the development of science that would have been looked upon a few years ago as nothing less than marvellous, and it is quite impossible for any man to possess even a tithe of the knowledge which is available at the present time. It is quite impossible for any man in any of the professions to master all the knowledge of the profession or calling in which he finds himself. Take the profession of law, for instance.

The discovery by Harvey of the circulation of the blood caused the practice of medicine to become a very much wider thing; and then, in comparatively recent times, the work of Pasteur and Koch and Lister gave a new impetus and a broader and wider field to medicine. When they discovered the fact that disease was due to certain microorganisms or pathogenic organisms in the blood stream, they threw a new light upon the whole question of disease; for before that, you know, it was thought that there were certain fluids in the body, and that a lack of harmony or balance in these fluids was the cause of disease or discomfort. More recently another discovery has added greatly to the wealth of knowledge in medicine—the discovery of the x-ray by Roentgen.

Now in many instances we can diagnose by using the x-ray to discover the conditions while the disease is still working in the patient; and that has added greatly to our knowledge.

Growing out of this increased knowledge and this decreasing size of the world, there has come into existence a motto that you find in nearly every business, especially in commercial businesses, and that motto is premised or contained in the two words, "Maximum efficiency." Now, what do these two words mean? Simply this: the greatest possible output for the least possible

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expenditure of time and energy. So we have our commercial experts in every large industry, trying to bring about that condition of maximum efficiency.

Now, what is the result of these changes that have come to the world? I think the result is seen in the fact that while there is an increase in output, that condition has practically brought about the death of initiative. In the days when a man made a pair of shoes, doing all the work himself, he put his own ideas into the work. When a man made a carriage, he put his own ideas into the building of that carriage. But now no one man does more than a small part of the work; he is simply a part of the machine, and the research work, the individual work, is left to the master minds. Years ago that same thought was expressed by Goldsmith when he went through Europe on foot, looking at the conditions of the various peoples in that part of the world, and when he put into his poem, "The Traveller," these words:

"Ill fares the land, to hastening ills a prey,
Where wealth accumulates and men decay."

To some extent, as the result of this attempt to bring about increased efficiency and output, men are decaying. But, happily, Goldsmith wrote another line in that poem:

"Those who think must govern those who toil."

It is true today, notwithstanding the labor unrest, that brains are greater than hands; that every action must exist first as a mental conception. So we ought to bear this in mind, all of us.

Referring again to medicine, you will remember the conception we all had of the old doctor who attended to us and our families. We would say that he knew our constitutions; he combined in himself the various specialties of the present day; he was the only specialist that was known. He was essentially a man who administered medicine, following the old line of the desire to restore that balance in the fluids of the body; and he administered medicine internally, hoping that this would be brought about. He was the physician, the surgeon, the obstetrician, the gynecologist, the oculist, the aurist, the neurologist, the psychiatrist, and the alienist. Now we have added a few more; there is the chiropractor, the osteopathist, the Christian Scientist—and the whole field has been divided and subdivided until it is almost impossible to differentiate between the many specialists of the present day. It is true that with the increase of knowledge this division became necessary, but division and subdivision have run riot during the present age. There are certain reasons for that condition. First, there is an unwillingness on the part of man to pay the price for knowledge. To get a wide knowledge means that a man must burn the midnight oil; so men are moving in the line of least resistance. They say: "Instead of trying to cover a wide field and become generally proficient, I will narrow the field of my endeavor and hope to cover it." In that way specialists have grown up. Then there is the advanced standard of living. Men and women today are willing to pay the price for the best goods and the best class of service; men realize that if they call themselves specialists and live up to their calling they can obtain increased

fees for their services, and that has had a great deal to do with the subdivision of medicine and dentistry into various classes or specialties.

As to the specialties in dentistry, possibly the first one is orthodontia. Then we have the pyorrhea specialist; the crown and bridge specialist; then the exodontist; then the prosthodontist; and recently the men who are engaged in pyorrhea work have called themselves periodontists. In fact, there are so many "dontists" that it is only with a good deal of courage, and almost an expression of regret, that some of us call ourselves "dentists."

Now, in my estimation—and I want to discuss this matter frankly with you—many of these subdivisions are absolutely unnecessary. As I see it, there is not room for more than two specialties in dentistry, one the specialty of orthodontia, and the other the specialty of oral surgery. Now this involves no reflection on the men who feel that they have a special aptitude for some particular calling. But it does mean that outside of these two specialties the profession of dentistry is sufficiently limited to enable any man of ordinary intelligence and common industry to give satisfactory service in these various lines, with the exception of the two that I have just mentioned. Why do I except orthodontia and oral surgery? As to orthodontia, the reason is—of course, this is only my own opinion—that the practice of this specialty requires a special fondness for and ability to get along with children. Every man does not possess that fondness and that ability.

Now, the orthodontist carries on his work largely with children, and he must be a man specially qualified to deal with them. Moreover, the practice of the specialty of orthodontia calls for, perhaps, a closer special study than any of the other mechanical branches of dentistry. It calls for a high standard of mechanical ability, a very accurate knowledge of the anatomy of the parts affected, and an absolute honesty of purpose in dealing with the patients and the parents of the patients. The work of the orthodontist is not finished, as in the case of our ordinary practice, in a day or a week, or two or three weeks at the outside; he must carry on the work for years; therefore, it requires a man of peculiar temperament and peculiar ability to practise orthodontia. Then there is another reason: up to the present, at least, I do not think that the work carried on in our schools has been sufficiently broad to enable a man to go out and practise orthodontia as successfully as he could prosthetic or operative dentistry.

In connection with this, as in connection with every other specialty, I may say that no man should go out from college and enter upon the practice of a specialty until he has had at least some years experience in general practice. Now, why? Well, for this reason: the tendency of all specialists is to become lop-sided—that is unavoidable. "As a man thinketh in his heart, so is he"; if he thinks orthodontia, then to him orthodontia is the biggest thing in life. If he thinks pyorrhea, then to him pyorrhea is the biggest thing in life. Then there is the inability of the specialist who has entered upon the practice of his specialty immediately after graduating to see the conditions from the standpoint of the general practitioner. Therefore, in order that he may have the confidence of the men who will send him their

patients, it is necessary that he should have some years at least in general practice.

Now for the case of the oral surgeon—that is, the man who will be able to operate for cleft palate, for hair lip, and for all the deformities that may occur in and about the mouth. Just there we approach the border line between dentistry and medicine, as this latter term is usually used. The question arises: is oral surgery a specialty in medicine or a specialty in dentistry. I have had a number of requests recently from all over the country inquiring whether dentists could come to Montreal and get some special work in oral surgery. Now, that is not possible for a man who is not trained in medicine and in surgery; a knowledge of both, it seems to me, is an absolute necessity. The essential thing in these operations is the condition after treatment and the possibilities of restoration. This demands the services of men fully trained in both sciences, but with their chief interest centered in dentistry. In the final analysis the permanent condition must rest with the skilled dentist. Now, in order to be an efficient specialist in that line, a man must be a general surgeon as well as a special surgeon. You could not imagine a man calling himself a general surgeon if he operated, say, only in cases of appendectomy. You could not imagine a man calling himself a specialist who would only operate for hernia or for hemorrhoids. These men are skilled surgeons, so we must have a man who is versed in the whole field of surgery, and who can make a success of his work if he goes into oral surgery, as Dr. Brophy, Dr. Gilmor, and other men are doing. I hope that in the near future we shall have in all our large cities, such as Ottawa, Montreal, Toronto, and so on, men who are trained and licensed both in medicine and in dentistry, and who will be giving their chief attention to mouth conditions, carrying along their intensive work in the line of dentistry.

Now we come to the question of the periodontist. In my opinion the work of the periodontist should never be divorced from that of the ordinary practitioner of dentistry; I believe that every man should do his own periodontoclasia or pyorrhea work. Now, this does not imply that I think that as good results are being obtained by the men in general practice as by those who are making a specialty of this work. I know that they are not. But it does imply that the man in general practice should be able to give just as good and intelligent service as the specialist, if he is willing to pay the price. On what do I base this assertion? There are many cases where a man is a general practitioner today and a specialist tomorrow. It is quite impossible that all who call themselves specialists should have assimilated a vast store of wisdom or manipulative ability sufficient to cause a wide difference between the so-called specialists and the man in general practice. On the other hand, I do know that many of these specialists who feel a fondness for and a special aptitude in certain lines of work have given months or years of particular attention to certain classes of work before finally making up their minds to adopt this work as a specialty. There is a reason for this. One reason is the necessity for study, and work, and practice, to develop a high standard of fitness. Another reason is the necessity for obtaining a

livelihood while preparing for the transition from general practice to the work of a specialist.

It is no longer possible to treat a case of pyorrhea, or interstitial gingivitis, or Rigg's disease, or trench mouth, or Vincent's angina, or ulcerated stomatitis, or any of these conditions, by whatever name known, with the instruments usually found in the office equipment of the man in general practice, or in the time generally given to such cases. In altogether too many cases, such service is still too closely linked with the old idea of "cleaning a set of teeth" and with the old fee of fifty cents or a dollar.

There is another reason why the specialist is able to command a respect and a fee out of all proportion to that enjoyed by the men in general practice. Go to the office of any of the men in the various specialties, and then go into the majority of offices of the men in general practice, and you will discover for yourself many of the reasons for this difference of respect and appreciation. Our men in general practice must lay seriously to heart the conditions of the office, their nearness to approach to aseptic conditions in all their operations.

One of the best known dentists in this province, a man known to every one of you said to me a good many years ago: "I should not have been a dentist. I have not one single, solitary mechanical idea in my mind. I do the thing that I have been taught to do until I become fairly proficient in that thing. I continue doing it the same way until someone tells me of a better way; then I try that better way. But I have never been able to offer anything original myself." Well, that man is one of the most successful dentists we have—why? Because of his suavity of manner, his courtesy, his culture of mind, and because of the way he has always kept his office in the city in which he practises. As I have intimated, he is perhaps, one of the most successful practitioners in the province at the present time.

There is a great need at the present time for a revival in study, so that the men who have been out of college for some time may have a chance to come in contact with recent discoveries in histology, pathology, and bacteriology, and with the variations in treatment made necessary by these discoveries.

I do not know whether you had here within the last two years, or perhaps within the last year, a man who was giving instruction in nerve-blocking and in conduction anesthesia. I do not know whether Dr. Smith has been here or not. I took his course in Toronto—not that I hoped to use it, but simply to keep in touch with the work and for the purpose of teaching students in the hospital. Then I took his course when he came to Montreal. Now, why did Dr. Smith meet with the success which attended his work everywhere he went? Simply because he was breaking virgin soil. The men whom he was teaching had practically no working knowledge of the anatomy of the head and face and neck. They had no idea of the area that would be anesthetized by the injection, say, into the infraorbital foramen, into the mental foramen, into the anterior and posterior palatine, into the mandibular foramen; so the great part of his work was simply that of teaching the minute anatomy of these parts upon which they were working. So much have we laid that

to heart that in McGill at the present time we are laying emphasis on that part of our teaching of anatomy. I think it is very important that a man should have a knowledge of the brain centers from which the nerves rise, their position in the brain, the parts of the anatomy supplied by the brain, the part that will be anesthetized by making an injection into any one of these nerves, the depth of these foramina from the surfaces, the length of needle necessary, the part that will be anesthetized.

I received a circular this week from a man who proposes to give a post-graduate course in the surgical extraction of teeth. Now, I think something of that kind is due at this time. Most of us have been extracting teeth in a manner which is anything but surgical. I think that a great advance is due, and can be brought about in this line. This man is giving a post-graduate course of four days for the modest sum of \$200. Now, that looks like a good big fee. We gave Dr. Smith \$1,800 for a week's work in Montreal. That looks like a good deal of pay for a week's work, but he was months and months down in Alabama, where there is no anatomy law, and where he could sit at the bedside until the patient died, call for the body two minutes afterwards, and prepare his specimens. He spent months down there doing work for which he did not get anything. So that if these men do qualify to give that kind of service which will enable you to go out and do better, why, we can afford to pay them a fairly good fee for the service they give.

This need of study is being supplied in many places by the study classes organized by the dentists in many American and Canadian cities. The method of conducting these splendid classes is as follows: a number of men form a class to study some phase of the regular work. After the fullest investigation these men divide the work into various steps, each member of the class becoming responsible for only one step in the operation, and doing this step so frequently that he becomes expert in it, and learns all its advantages and disadvantages, its easy parts and its difficult parts. So classes have been formed in prosthetic restoration, in the technic of inlay work, in conductive and block anesthesia, in the treatment of pyorrhea, in removable bridge-work, in partial denture work. Recently Dr. Nesbit, of Boston, gave a course of instruction in cast clasp work, setting forth what I believe to be so far the most suitable way of making restorations that the profession has yet learned of, getting away from the necessity of grinding down and mutilating teeth in order to put on shell crowns.

In order to keep abreast of the times it is quite necessary that many of our dentists should obtain a new perspective of their relation to their patients, to themselves, and to the profession. It is simply impossible for any man to keep abreast of the times without stated periods for study and observation. It is just as necessary, if a man is to attain to his own full stature, that he should spend a certain amount of money every year in study, in travel, in coming in contact with his fellow practitioners, in order to keep in touch with the newer developments, as it is that he should spend money for coal, or groceries, or clothing, or material, or for instruments for his office.

Indeed, his ability to buy the things usually spoken of as the necessities of life will probably be in direct ratio to the time which he spends in study and improvement, because the latter expenditure will immeasurably increase his earning ability.

Specialists are here to stay. Some men are criticizing them. Some who are suffering financially are finding fault. Most thoughtful men in the profession recognize the fact that a further subdivision would be a calamity, and that even some of those already in existence should revert to the general practitioner, whence they sprung.

In the final analysis, dental service is on a par with the bulk of commercial commodities. It is a question, not only of supply and demand, but a question of the excellence of the thing purchased. The whole world knows today the value of mouth hygiene, as well as the value and importance of a well-kept set of natural teeth. Because of this knowledge, those who can pay for dental service are going to have that service from the man who can render service of the highest standard, and that, in many cases, regardless of the fee that may be charged.

The important thing for each one of us to consider is this: Am I capable of rendering to my patients as good service in the field in which many men are now calling themselves specialists as are the so-called specialists, or, if I am to be honest with these patients, must I send them to some other man, conscious that they will receive a standard of service which I cannot personally give to them? The whole question resolves itself into two points—personality and efficiency. I thank you. (Applause.)

DEPARTMENT OF ORAL SURGERY AND SURGICAL ORTHODONTIA

Under Editorial Supervision of

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THE USE OF THE CHISEL AND Mallet IN THE EXTRACTION OF TEETH*

BY BOYD S. GARDNER, D.D.S., ROCHESTER, MINN.

Section on Dental Surgery, Mayo Clinic

IT IS very apparent that a great change is taking place in the technic of removing teeth, and it is obvious that this change is due largely to the reason for their extraction. No doubt for many centuries teeth were extracted for the sole purpose of eliminating the immediate pain with little or no consideration for the trauma produced or the postoperative pain and discomfort, and, therefore, an instrument that would remove the teeth was considered quite satisfactory. Today the attention of the dentist is directed to instruments that will make it possible to remove a tooth in its entirety with the minimum of trauma and at the same time remove all pathologic conditions.

In the selection of instruments, the thought of safety to the patient should be the first consideration. Are certain instruments and the technic employed in their use safe? Can the beginner make use of them without risk to the patient and successfully?

The use of the chisel and the mallet to extract teeth does not follow a principle that is new to the dentist. Undoubtedly the technic of gold foil work which the dentist learns while he is a student teaches him control, and the gold plugger with the mallet, which has been the technic of choice, demonstrates to the student that he is employing a technic and making use of instruments that at all times are under his control. Consequently, in teaching the student to remove impacted teeth and other teeth difficult to remove, he soon becomes confident not only of success so far as removing the tooth is concerned, but also confident of the safety of the procedure.

The stone cutter in cutting a letter in a piece of stone makes use of a mallet that meets his chisel at a right angle and thereby obtains a uniform

*Presented before the American Society of Exodontists at the meeting of the National Dental Association, August, 1920, Boston.

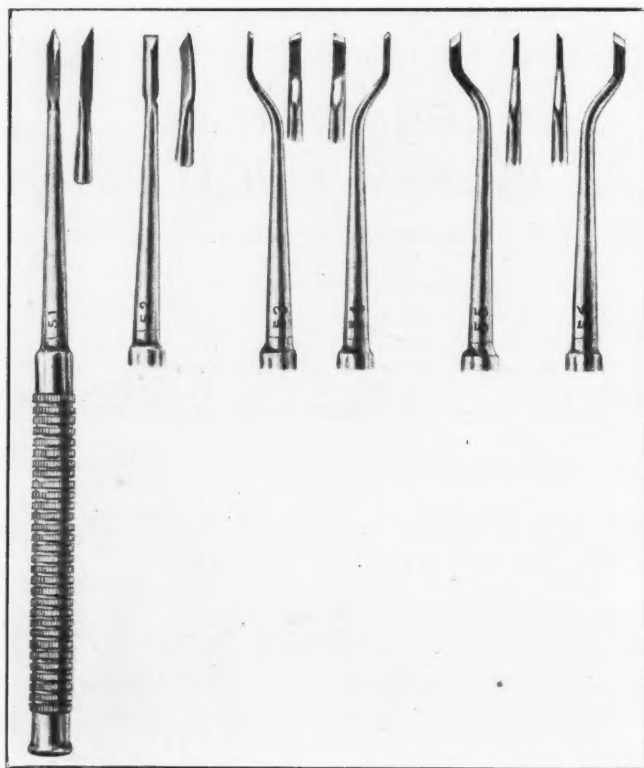


Fig. 1.—A set of six chisels which are used with the mallet in the extraction of normal as well as impacted teeth.

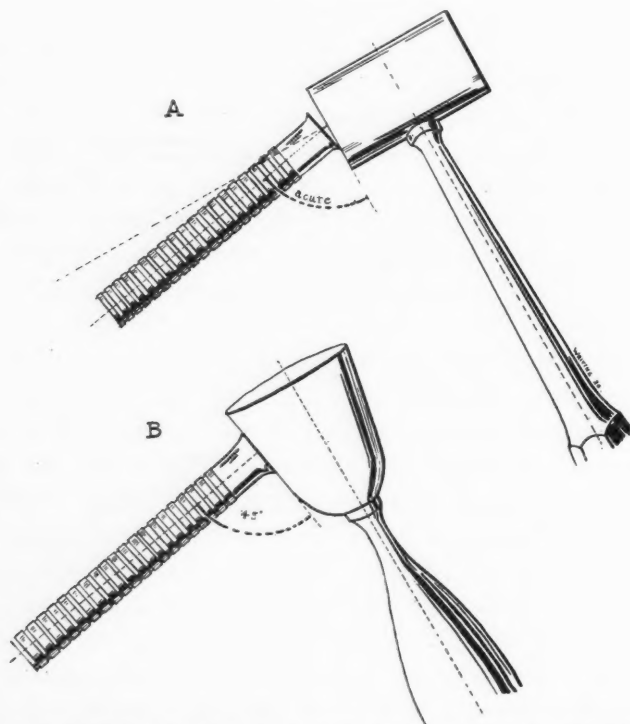


Fig. 2.—The two types of mallets: *A*. The chisel is not receiving the full value of the mallet since the mallet does not meet the chisel at a right angle. *B*. The chisel being hit at a right angle and the instrument receiving the full value of the blow.

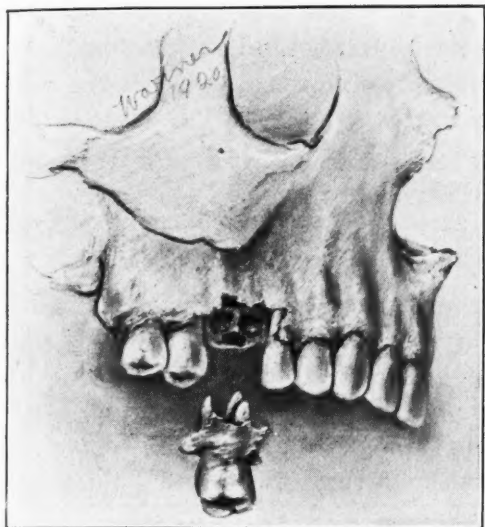


Fig. 3.—A result not unusual when the forceps has been used to extract the superior first molar. Note the loss of process of the adjoining teeth.

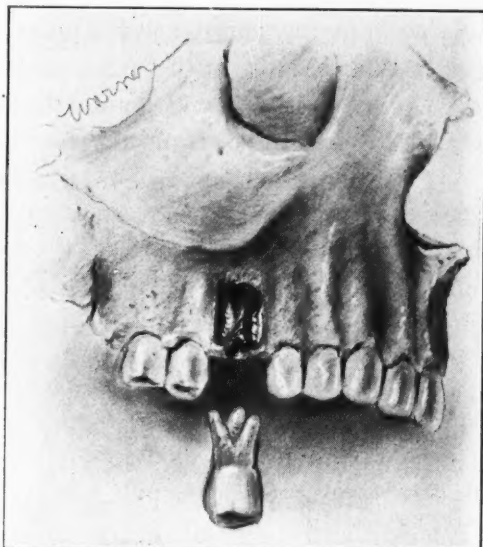


Fig. 4.—A result of the chisel technic in removing the superior first molar without fracture of the process or injury to the adjoining teeth.

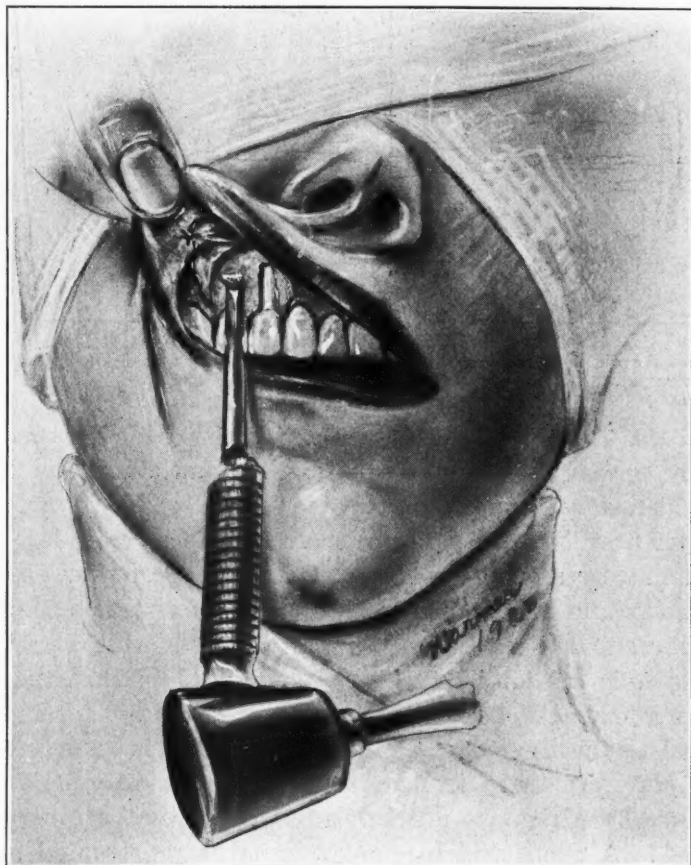


Fig. 5.—The use of Chisel 52 with mallet. This instrument is used more often than the other five for removing normal and impacted teeth. The buccal plate is being removed from the roots of the two upper bicusps.

and controllable force. In order to be successful in cutting a letter he must be able to stop the chisel at any point so that the letter may not be overcut. Similarly, the surgeon in performing a radical operation on the mastoid, does not employ hand or arm pressure to drive his chisel, but makes use of the mallet, for a slip in his work might mean a fatality.

In selecting chisels an effort has been made to find narrower instruments since the blow necessary to drive a wide instrument is much too severe and tends to increase trauma (Fig. 1). The weight and shape of the mallet is also considered. With the usual type of mallet the chisel is rarely hit at a right angle either by the operator or the assistant. Accordingly a type of mallet that is more or less new to the dental profession has been tried with a great deal of satisfaction (Fig. 2). This type of mallet is centuries old to the sculptor and stone cutter and now is used by the orthopedic surgeon. With it instruments always may be struck at right angles and the full volume of the blow thereby realized; the operator may hold the chisel without the usual tight grip and the resulting cramp in the hand.

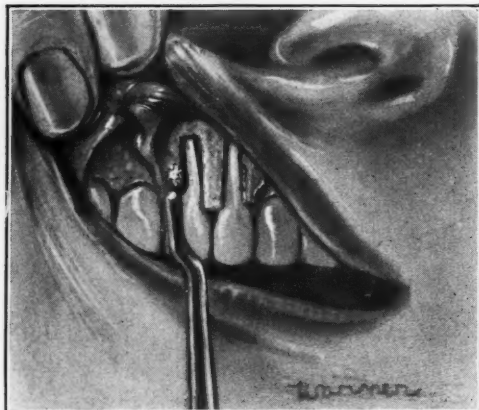


Fig. 6.—The use of Chisel 55 which is shown cutting the process at the distal of the cuspid without injury to the bicuspid.

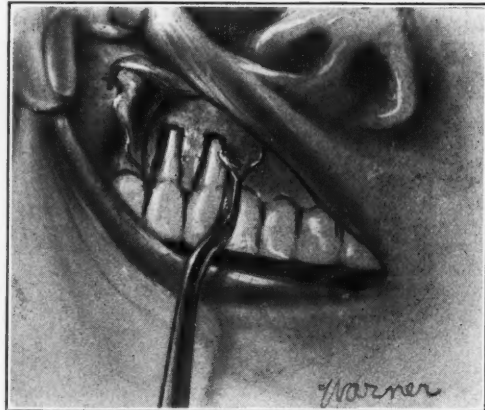


Fig. 7.—The use of Chisel 56. The process is being cut at the mesial of the first bicuspid without injury to the cuspid.

No doubt the mere removal of the tooth has been paramount in the minds of many operators, and the treatment of adjoining teeth and post-operative considerations have been largely neglected. The extraction of either a lower or upper first molar emphasizes the points to be considered. We may assume that the average operator has selected his type of forceps for removing the first molar and has been successful in the extraction; this success is the demonstration to the patient of the extracted tooth free from process, since otherwise it is at times difficult to convince him that the jaw is not fractured. Such extraction usually is accomplished by forcing the tooth from the buccal to the lingual until the socket either is enlarged sufficiently or the buccal plate fractured in order that the tooth may be removed. In such a procedure have the two adjoining teeth and the postoperative results been considered? A result which is not unusual is represented by Fig. 3; it is very apparent that the adjoining teeth have been robbed of sufficient osseous tissue to make it impossible for them to return to normal. Not only are

the adjoining teeth affected but the sockets are left in a condition that would not follow a well performed operation. Fig. 4 allows a comparison of the forceps procedure with the chisel and mallet technic. In this case the buccal plate has been removed in such a manner that not only the two adjoining teeth are left undisturbed, but the edges have been cut so that it is possible to get the maximum of regeneration, if the soft tissues have been properly considered. When the buccal plate is removed the tooth is easily removed without the slightest pressure to the lingual, and only in very unusual cases is it necessary to cut the buccal roots in order to extract the upper first molar with the greatest amount of ease.

In Figs. 5, 6, 7, 8, and 9 the different steps in the operation are shown and they demonstrate the use of the different chisels.

If the tooth has a granuloma at its apex it is obvious that the granuloma may be removed without any chance of leaving a part of it.

Until the last few years the use of the chisel and mallet has been more or less limited to the extraction of the impacted or otherwise malposed teeth.

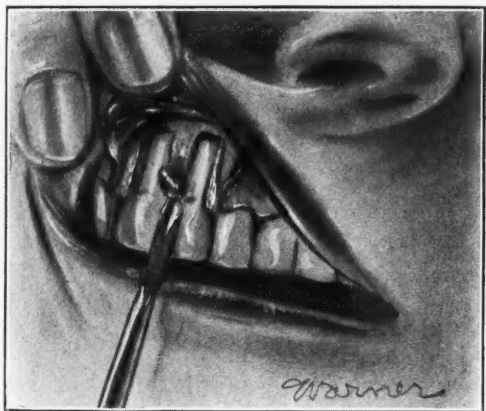


Fig. 8.—The use of Chisel 51. This instrument is used only for cutting the process between the roots of the two teeth to be extracted.

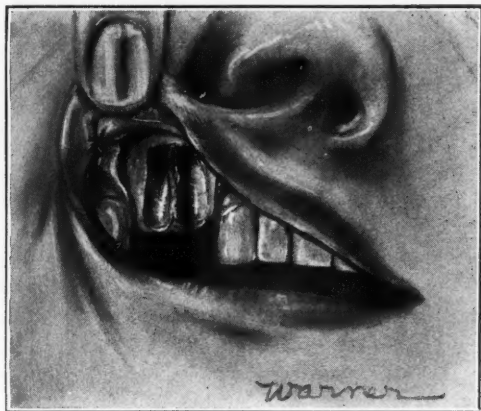


Fig. 9.—The usual result after the removal of the two superior bicusps with the chisel and mallet technic.

However, their use in removing teeth with definite pathologic conditions has been emphasized by Novitsky, Shearer, Lucas, Molt, Bosworth, and others.

In the extraction of the impacted lower third molar a definite technic may be carried out under the eye. The osseous tissues are cut away in such manner that actual cuttings can be demonstrated (Fig. 10). It is questionable if this can be accomplished by the hand and arm pressure technic. The tooth is prepared for the use of the elevator with the minimum amount of trauma and without the so-called wedging result. The socket after the removal of the tooth is left in such excellent condition that it cannot be criticized from the standpoint of bone surgery.

SUMMARY

The use of the chisel and mallet for the extraction of normally placed, as well as impacted and otherwise malposed teeth is safe and successful even in the hands of the less experienced operator. With their use, the sockets and the processes in general are left in a condition that will not be criticized from

the standpoint of surgery. The operator using the chisel and mallet technic not only can remove all roots but also attached granulomas and other pathologic conditions.

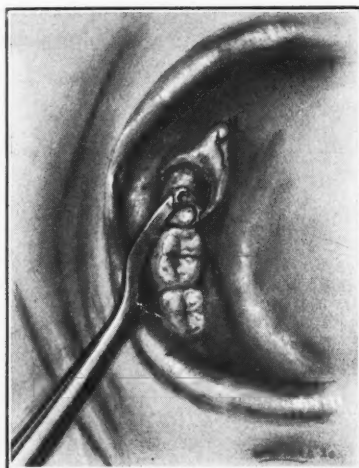


Fig. 10.—The use of Chisel 55 in the removal of the impacted lower third molar. The cutting point of this chisel is with the long axis of the instrument, and the curvature enables the operator to work around the second molar.

BIBLIOGRAPHY

- Lucas, Molt, and Bosworth: Personal communications.
 Novitsky, J.: Dead teeth. *Dental Summary*, 1919, xxxix, 426-432.
 Shearer, W. L.: External Alveolectomy. *Jour. Natl. Dent. Assn.*, 1920, vii, 499-504.

DISCUSSION

F. F. Molt.—There is not the slightest doubt that opinion is changing vitally with regard to the advisability of surgical procedure in extraction. The operation must be seen to be thoroughly appreciated, but it is entirely rational.

The inadequacy of attempted curettage in the majority of extensive periapical involvements, when the granuloma cannot be seen but must be approached through the tooth socket would seem self-evident. If the area to be curetted is necrotic and not limited by a sclerotic wall, or if the radiogram shows the probability of encroachment upon adjacent anatomic structures, notably the maxillary sinus, the floor of the nares, the anterior palatine foramen in the maxilla or the mental foramen or inferior dental canal in the mandible the desirability of what may be called the "open view operation" becomes imperative.

Then again, when we are called upon to prepare a mouth for dentures, the results obtainable by surgical procedure ignoring the factor of pathology entirely, are so far superior to those from ordinary extraction methods that there is no comparison. Considering those cases of complete extractions where there is extensive pathology the alveolectomy procedure permits of definite and thorough elimination of all these areas with no stirring up or dissemination of infection, thus removing the formidable feature of reaction.

For this type of operation the use of the mallet and chisel is as essential as is the retraction of the tissue flap, for with definite strokes of the mallet one may limit his bone cutting where he wishes. The varying degree of calcification presenting in different subjects is such that the hand pressure that would accomplish extensive cutting in one case would fail to penetrate in another, and when one is compelled to use vast pressure one passes the danger line.

In the use of hand chisels in removing impacted teeth there is not the slightest doubt that some operators can achieve results. It is possible that some cases are considered inoperable by such a technic, but my personal preference is for an operation throughout which I can see what I am accomplishing.

The hand chisel is in no measure self limiting. Consider if you will the possibility of accidental encroachment upon vital tissues. The operator can, of course guard the tissues with the fingers of the other hand at the risk of serious injury to himself, for a deep cut under such circumstances with its possibilities as an inception of infection is not to be considered lightly. With these possibilities therefore, which cannot be ignored, the balance would seem to lie with the more lengthy but more definitely careful operation.

Dr. Gardner is to be complimented upon his paper. Both the position that he occupies and his ability as an operator give his statements weight. He has undoubtedly had ample opportunities for comparing results obtained by each method. A great deal of credit is also due him for the products of of his ingenuity—the chisels and the mallet that he has shown. Although I have had as yet no opportunity to try out this new type of mallet, the mechanical features appeal to me and I shall not be surprised if it will prove to be an improvement upon the ones we have been using.

DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

Under the Editorial Supervision of

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It is the object of this department to publish each month original articles on dental and oral radiography. The editors earnestly request the cooperation of the profession and will gladly consider for publication papers on this subject of interest to the dental profession. Articles with illustrations especially solicited.

SOME SUGGESTIONS FOR THE STANDARDIZATION OF DENTAL RADIOGRAPHY

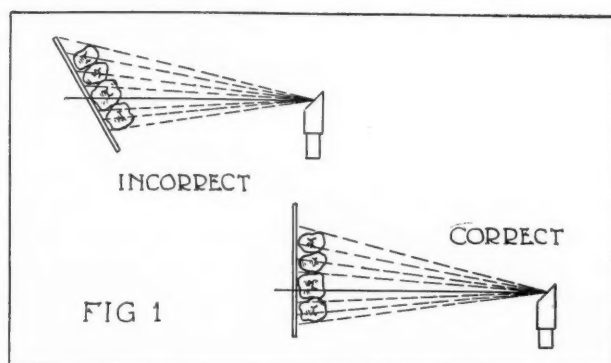
BY A. W. SCHELL AND C. S. SPANGLER, WASHINGTON, D. C.

THE postures used in radiographing the bones and joints have been standardized so that there is no longer any difficulty in this respect in comparing the work of different laboratories. These standard positions are used in practically all laboratories with very few variations. The centering of the normal ray and the angle of the tube have become fixed quantities for the various positions of the bones and joints, but unfortunately the procedure in radiographing the teeth has been left largely to guesswork, or to judgment, and when too few dental films are made to develop this sense of judgment in the technician, it amounts, after all, to guesswork. No definite rules have been adopted whereby good dental negatives may invariably be produced. The reason for this is partly because the importance of demonstrating on the film all the structure of the teeth and the alveolaris has been underestimated, and partly because the visualization of the relations of the film, part, and tube, is somewhat difficult, and also because the idea is prevalent that the angles of the teeth in different subjects are rarely the same. From observations, from the viewpoint of the radiographer, of the teeth of patients differing widely in their habits, mode of life, and age, and experimentation in applying similar technic to all, it has been found that, with the exception of changes produced by advanced pathological processes, such as excessive hypercementosis, or pyorrhea, and in exceptional cases presenting developmental defects, there are a number of factors which are constant to all. It is the purpose of this paper to bring these before the attention of technicians who are engaged in dental radiography as an attempt toward the standardization of dental postures, and any discussion will be welcome to the authors.

There are, then, a number of factors which can be kept constant for every patient, and if the technician will keep them so, much of the guesswork incident to the production of good diagnostic films will be eliminated. These factors will be taken up separately, and may be enumerated as follows:

1. Relative position of the tubestand to the chair and to the patient.
2. The sagittal plane of the head absolutely and constantly vertical.
3. The crowns of the teeth lying in a horizontal line.
4. The crowns of the teeth lying in a line parallel to the axis, or the target, of the tube, except when using the "right angle" Coolidge dental tube, when this line will be perpendicular to the target.

Considering the first factor, the relative position of the tubestand to the chair and the patient, it has been found that it is most convenient to place the tubestand at the right of the chair, so that the tube carriage extends across and in front of the patient's head, with the tube turned so that the ray is horizontal. When using special dental units, this, of course, will not apply, but the purpose in presenting this factor is to aid the technician who



is not equipped with special dental apparatus and must use the regular tubestand. This position for the stand will be found convenient, because it will not be necessary to move the stand during the operations, as the tube may be either raised or lowered or shifted laterally across the face by means of the carriage. Also, the carriage may be swung away from the chair to admit the patient, or to give the operator more room while placing the film.

The sagittal plane of the head is to remain absolutely vertical. If this point is not closely watched—that is, if the head is tilted to either side—the angle of the ray must be changed to conform to the new position, and it would be impossible to state a definite angle for the ray unless the position of the head is kept constant. Therefore, the success of this system will depend upon this point probably above all others.

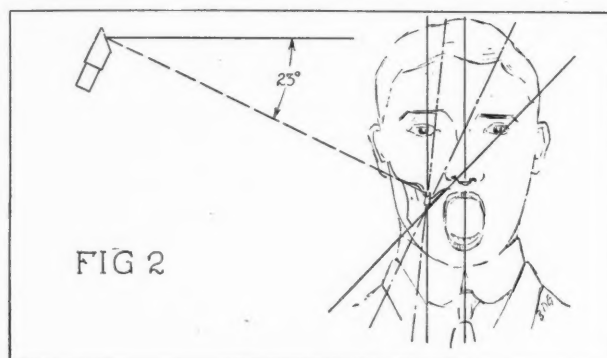
If the crowns of the teeth are shifted out of the horizontal line, the shadows of the teeth will partly superimpose, thus blotting out some of the structures important to accurate interpretation and distorting the relation of the apices and surrounding structures. Furthermore, the clean-cut appearance of the finished film will be destroyed.

For a similar reason this same line (the line of the crowns) must be paral-

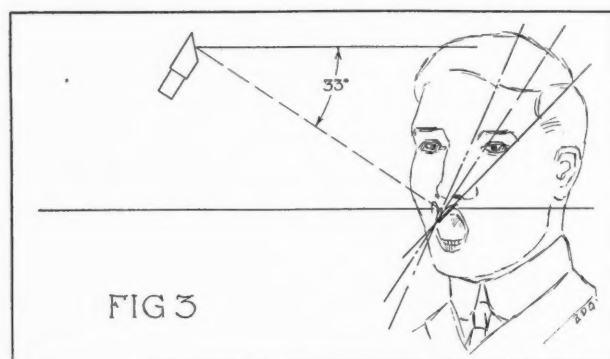
lel to the axis of the tube—that is, perpendicular to the normal ray—for if the head is turned so that the crowns of the teeth lie in a line which is not at right angles to the normal ray, the shadows of the individual teeth will superimpose laterally. This factor must be represented diagrammatically as in Fig. 1.

These four points will remain constant for every patient. Having made these certain, it is possible to proceed with a definite tube angle for each type of teeth, upper and lower, the only indefinite factor remaining to be defined being the points upon which the normal ray is centered in each case.

The following angles and center points have been found satisfactory, it having been necessary to vary them only under very exceptional circumstances:



(Maxillary Molars.)



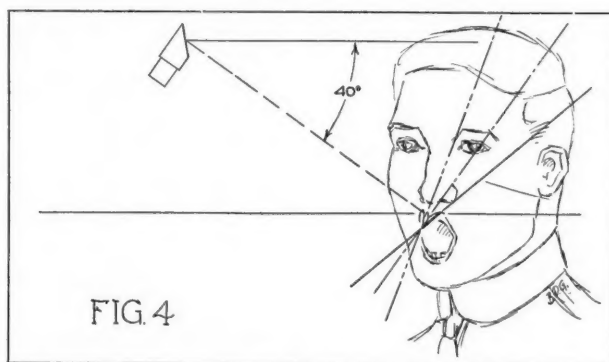
(Maxillary Premolars.)

MAXILLARY MOLARS

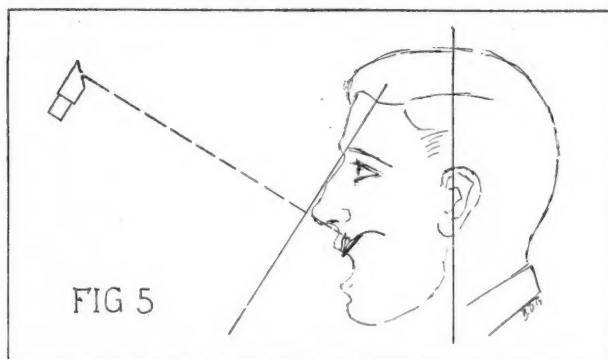
1. The sagittal plane absolutely vertical.
2. The line of the crowns horizontal. This may necessitate tilting the head slightly forward, as, in opening the mouth to receive the film, the head is generally thrown upward.
3. The line of the crowns parallel to the axis of the tube (perpendicular to the normal ray).
4. Tube tilted 23 degrees below the horizontal. (The ray directed 23 degrees downward.)
5. The normal ray centered on the lower border of the zygomatic and over the second molar.

MAXILLARY PREMOLARS

1. The sagittal plane absolutely vertical.
2. The line of crowns horizontal.
3. Line of crowns parallel to axis of tube. This will necessitate turning the face slightly more toward the tube, but care must be taken to see that the sagittal plane remains vertical and that the crowns remain horizontal.
4. Tube tilted 33 degrees below horizontal. (Ray directed downward 33 degrees.)
5. Normal ray centered between the two teeth and on a line with the lower border of the zygomatic.



(Maxillary Canines.)



(Maxillary Incisors.)

MAXILLARY CANINES

1. The sagittal plane vertical.
2. Line of crowns horizontal.
3. Does not apply, but the general line of crowns should be kept as before.
4. Tube tilted 40 degrees below horizontal. (Ray directed downward 40 degrees.)
5. Normal ray centered over the tooth on a line with the lower zygomatic.

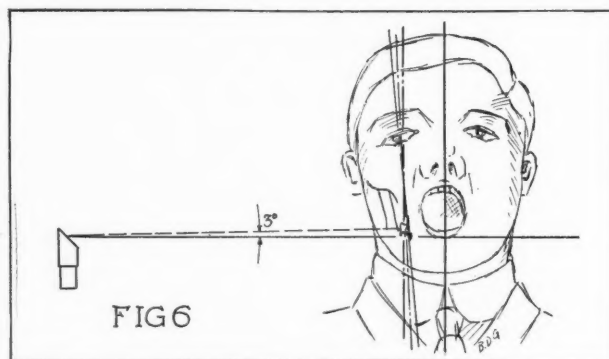
MAXILLARY INCISORS

1. The sagittal plane vertical.
2. Line of crowns horizontal.
3. Line of crowns parallel to axis of tube.

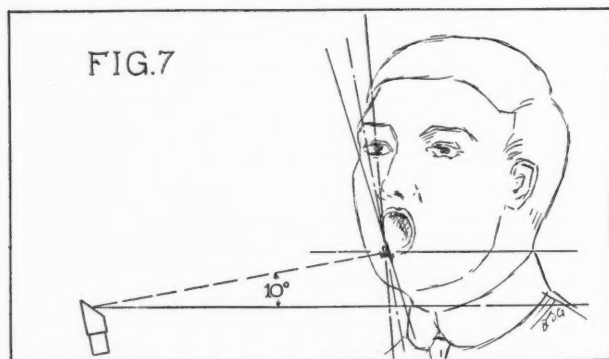
4. Normal ray perpendicular to the line of the nose.
5. Normal ray centered between the central incisors, over the tip of the nose.

MANDIBULAR MOLARS

1. The sagittal plane vertical.
2. Line of crowns horizontal.
3. Line of crowns parallel to axis of tube.
4. Tube tilted 3 degrees above horizontal (ray directed 3 degrees upward).
5. Normal ray centered over the second molar just anterior to the attachment of the Masseter on the jaw.



(Mandibular Molars.)



(Mandibular Premolars.)

MANDIBULAR PREMOLARS

1. The sagittal plane vertical.
2. Line of crowns horizontal.
3. Line of crowns parallel to axis of tube.
4. Tube tilted 10 degrees above horizontal (ray directed 10 degrees upward).
5. Normal ray centered between the two teeth.

MANDIBULAR CANINES

1. The sagittal plane vertical.
2. Line of crowns horizontal.
3. Line of crowns parallel to axis of tube.

4. Tube tilted 15 degrees above the horizontal (ray directed 15 degrees upward).

5. Normal ray centered over the tooth (at the angle of the chin).

MANDIBULAR INCISORS

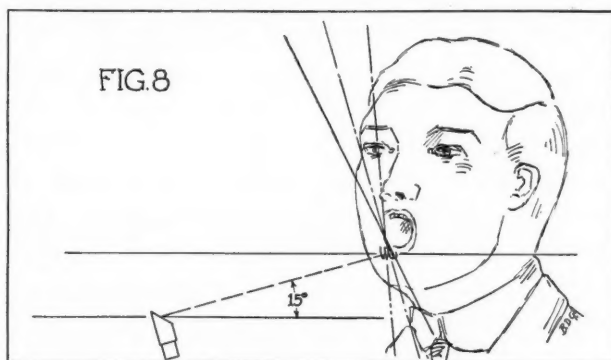
1. Body erect, head thrown back to an angle about 45 degrees, mouth wide open.

2. Line of crowns horizontal.

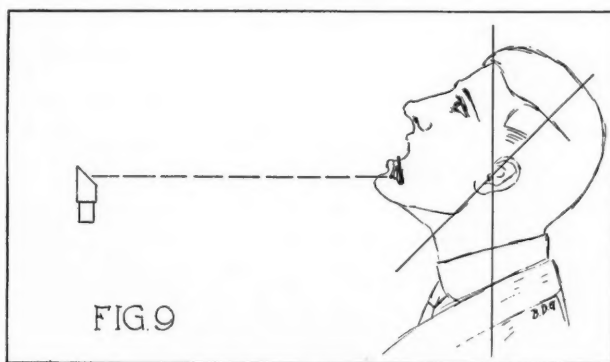
3. Line of crowns parallel to axis of tube.

4. Tube tilted to horizontal. (Ray directed on a horizontal line.)

5. Normal ray centered between the central incisors, at the tip of the chin.



(Mandibular Canines.)



(Mandibular Incisors.)

Although the first three points in almost each case are repetitions, their importance cannot be overestimated, because the success of the entire technic depends upon the strict attention of keeping the sagittal plane of the head always vertical and the crowns of the teeth always horizontal. In order to accomplish the latter in taking the lower teeth it will be necessary for the head to be thrown back considerably, especially when taking the lower incisors. As an aid in retaining these positions a simple form of headrest is desirable, and although it may be dispensed with if the patient is carefully instructed as to the importance of holding the positions, its use will tend to steady the head and relieve the strain upon the muscles. It is, of course, perfectly permissible and desirable to have the patient shift the position of

the body in the chair in order to relieve the discomfort which would otherwise attend, especially where long exposures are necessary, but the operator must be at great pains to see that the relative positions of the head and the tube are not interfered with by changes in the position of the body.

The voltage and current will depend upon the type of apparatus used. A three-inch gap is considered sufficient, backing up a current of from ten to twenty milliamperes. Using this setting, an exposure of five seconds is about an average for upper molars, but the time will vary with the weight, or thickness of the parts. This technic will be satisfactory for use with the regular film, and when extra fast films are used the time will be reduced accordingly. It is found, however, that better results are obtainable with the regular than with the fast films, although the use of the latter may be advocated in the case of nervous or young patients.

It is advisable to use the index finger of the left hand in holding the films on the right side, and the index finger of the right hand for those on the left side, with the thumb for the incisors. The patient should be carefully instructed how to hold the films, and also of the importance of not letting them slip from the position in which the operator places them. The corners of the films should be bent to conform with the soft tissues, to prevent pricking or gagging.

Finally, the entire process should be performed without any evidence of haste, giving the patient time between each exposure to compose himself in a position as comfortable as possible.

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

The Etiology of Open Bite. A. Sulke. Zahnärztliche Rundschau, 1920, No. 44, p. 537.

Open bite is an anomaly of occlusion in which on closure of the jaws only the molars and perhaps also the premolars are brought in contact, while an interval of two to ten mm. is left between the incisors and canine teeth. At the same time, the nasio-mental distance is greater than in the normal profile. The condition was first described by Carabelli, according to whom open bite is also known as "mordex apertus Carabelli." In the formation of open bite, deformities of the upper jaw are of more decisive importance than those of the mandible, the latter may more or less aggravate open bite, but do not furnish a primary etiologic factor, as is sometimes assumed. Nasal stenoses, pathologic conditions in the pharynx with associated mouth-breathing, rickets, macroglossia, habitual sucking of the thumb or fingers, may cause open bite, acting alone or in combination, in conformity with their mechanical action. In those cases in which the above-mentioned factors are not demonstrable, the displacement of dental germs, notably of the molars, below the nasal floor, with a tendency to grow perpendicularly downwards, furnishes an acceptable explanation for the origin of open bite and the associated high and narrow palate. The verticle position of the tooth-germs below the nasal floor can appear in the first as well as in the permanent denture. In the former, on account of the small size, it is not likely to produce a very striking anomaly, but in the permanent denture, the eruption of every additional analogously displaced molar may aggravate the deformity, the bite being totally open from the right to the left wisdom tooth. The following three symptoms are almost invariably met with in cases of open bite: (1) Mouth-breathing; (2) an obtuse mandibular angle; (3) hypertrophy in the molar region. These conditions are sometimes erroneously regarded as the cause of open bite. Careful examination of individual cases and prolonged observation is the only way to ascertain the etiology in a given instance. Open bite may become aggravated through secondary factors, extraction of teeth leading to constriction of the jaw, especially when done on the milk denture.

Orthodontic Limitations. F. C. Kemple. *The Dental Cosmos*, 1920, lxii, No. 11, p. 1327.

The author cautions against considering the accomplishment of so-called ideal occlusion, as obtainable by means of practical orthodontia, in the great majority of the cases. In his experience with malocclusion, the greatest difficulty was usually encountered in determining the cause, and the best manner of its removal. The final results rarely measured up to the ideal standard. It is a mistake to regard ideal occlusion as the normal occlusion, and another to assume that slight variations from the so-called normal require correction. The experience of men who have had from fifteen to twenty years of orthodontic practice, and who possess unusual technical ability, is to the effect that they have no assurance of ideal results from their treatment; the ideal aimed at being attained only in exceptional instances. Their findings agree with the author's own, for he could recite many cases in which he was unable to secure an ideal overbite, and many others in which he could not establish an ideal mesio-distal interdigitation of the molars and bicuspids *on both sides of the mouth*. In other cases, he did not succeed in producing a *permanent* alignment of the upper and lower incisors and cuspids, no matter if the treatment were begun at the early age of five or six years, or put off until the age of nine or ten. Such results should not be classed as orthodontic failures, however, but in the author's opinion represent only natural orthodontic limitations. They are imperfect only in the sense of not complying with a false and arbitrary standard. In all anatomy, the *normal* embraces a wide range of variation, and the human mouth is no exception to this general rule. There is no such thing as perfect symmetry in nature. Under these conditions and with the unfavorable prognosis for the average case of malocclusion, it seems most ill advised for the orthodontist to attempt the correction of every slight malocclusion that is presented in practice. In many of these cases it is dangerous not to "let well enough alone."

Complicated Eruption of a Lower Wisdom Tooth. G. Maurel. *La Revue de Stomatologie*, 1920, xxii, No. 9, p. 509.

The patient, a young woman twenty-one years of age, presented a muscular deviation of the lower jaw towards the right side, the trouble having begun with severe pain in the region of the ascending ramus of the right mandible and in the right auricular region, followed by swelling of the cheek, tight constriction of the jaws, and persistent otalgia. On account of the swelling in the parotid region, the diagnosis of mumps was rendered but was found to be erroneous after the patient had been kept under observation for twelve days. At this time she was first seen by the author, who in spite of a somewhat negative examination of the dental system assumed the existence of a noninfectious reflex parotiditis of dental origin. The extraction of some roots was followed by very gradual improvement of the symptoms, but a certain degree of induration persisted under the parotid swelling. When the patient opened the mouth, the lower jaw became very markedly deviated towards the right side, suggesting an infectious or reflex contracture of the masticator muscles of the

right side, more particularly a functional disturbance of the masseter muscle. Radiographic examination showed an almost completely calcified lower wisdom tooth at the level of the alveolar margin in the region of the maxillary angle; this tooth was bent slightly forward, the biting surface being no longer in contact with the bone, but only with the mucosa. There was a somewhat darker zone around the crown, suggestive of an infection of the pericorony sac. Repeated instrumental examinations now showed that the wisdom tooth was actually accessible by the endo-buccal route and that a very fine passage seemed to exist in the gingival mucosa. The etiology of the trouble was thus explained as due to abnormal development of the right lower wisdom tooth, infection of the pericorony sac, and remote disturbances of the right masseter muscle and the parotid gland. The glandular swelling was presumably of reflex origin and connected with the infection originating at the level of the wisdom tooth. The treatment to be recommended consists in the extraction of the wisdom tooth responsible for the train of symptoms.

Origin of Dental Configuration. G. Aichel. *Anatomischer Anzeiger*, 1920, lii, No. 19, p. 417.

The shape of the teeth is not influenced by the food, but it governs the selection of the food. Similar dental configurations do not always correspond to a similar mode of nutrition, and *vice versa*. The tooth does not alter its shape in the period of function. It is purely theoretical to assume a transmission of functional stimuli through the cells of the dental pulp to the germinal cells and a response to these stimuli through changes of configuration in the succeeding generation. The causes which determine the change are unknown, but two principal factors are active in this connection, (1) mechanical influences in the environment of the tooth-germ, which may lead to changes of configuration in the presence of hereditary fixed shapes of teeth, as well as in the absence of such heredity, resulting merely in arrest and inhibition shapes in the first group of cases; (2) the capacity of variation of the fundamental tissues composing the tooth-germ involves the potential development of an infinite variety of dental forms. Changes in the configuration of the teeth lead to a modification of the animal's food.

Teeth Must Have Exercise. U. S. Public Health Service, 1920, Washington, D. C.

In connection with the relation of food to good teeth, the influence of exercise must be kept in mind. Regular use of the teeth for chewing helps to make stronger and better teeth. The food should therefore be presented in such a form that it will require chewing. For this reason the diet should include a certain amount of coarse material, especially designed to strengthen the teeth. Coarse whole-grain breads, hard tack, baked potatoes, eaten with their skin-jackets, fresh apples—these and similar articles included in the food will help to make good teeth. The two most important elements needed in the diet for building sound teeth are lime and phosphoric acid, and for the growing child there is not a better source of these than milk. In addition to

this there should be other sources of mineral salts, such as fruits, green vegetables, and pure water.

It is not a matter of coincidence that in the Presbyterian Hospital in Chicago, out of 332 patients who were suffering from severe rheumatism and joint trouble, 89 per cent were found with chronic abscesses of the teeth, or that at the Cook County Hospital, Chicago, 76 per cent of the rheumatic cases were found with chronic abscesses of the teeth. There is strong reason to suspect that mouth infections may often be the cause, or at least a contributing cause, of many diseases, such as tonsillitis, articular rheumatism, St. Vitus' dance, certain forms of heart and kidney diseases, and obscure stomach ailments.

Gangrene of the Roof of the Mouth During Influenza. Ritter. *Zahnaerztliche Rundschau*, July 6, 1920, xxxix, 27.

A man of 35 entered the author's office with the following picture of disease: all of the upper front teeth were involved in a marked stomatitic process. The incisors and canines were loose and the gum corresponding to the incisors was greatly puffed up and much pus could be squeezed from it. The hard palate was the seat of a severe necrotic process studded with whitish, rounded nodules and ulcerous loss of substance. Perhaps a third of the hard palate was involved on both sides. There was absolutely no similarity to ordinary stomatitis ulcerosa. The whole process had begun about 8 days before consultation. Patient had been taken with chills and fever while at work and had been compelled to seek medical advice—diagnosis of the physician, influenza. The grip-pal symptoms had passed off leaving the present condition in the mouth. Two teeth (incisors) were drawn and the necrotic mass curetted after which a sound readily penetrated the rotten tissue of the hard palate for 3 cm. The entire raw surface was painted with iodine tincture. After several days without improvement, in which the patient was becoming weak, a surgeon was called in. Before a microscopic examination to exclude malignant disease could be completed the patient sank and died of sepsis. Whether the condition could be regarded as an anomalous form of noma is not debated but it seemed to have been parallel with that affection, occurring in connection with an infectious disease and pursuing a rapidly fatal course.

Submaxillary Adenites of Dental Origin. Landetey Arago and Mayoral. *La Odontologia*, April, 1920, xxix, 1.

The four lower incisors correspond to the submental glands. These comprise nodes *a* and *b* and of these node *a* is also in relation with the lower canines, premolars and first molar while node *b* is seated further back, with the second molar. Ganglion *a* is also connected with the incisors, canines and premolars of the upper jaw and ganglion *b* with the premolars and second molars of the upper jaw. Ganglion *b* however drains in part the first and third lower molars, while the wisdom teeth also drain into the submaxillary nodes. It is, therefore, obvious that the submental nodes may be infected from most of the teeth, at least in theory. The author gives several photographs of submental infections accompanied by radiograms showing the teeth from which the infec-

tion proceeded. Among the affections of the teeth that may cause these infectious adenites are simple periodontitis, chronic neoplastic periodontitis, periapical abscess, suppurative dento-alveolar arthritis, pericoronaritis, ulcerative stomatitis, etc. The text of the article, however, is devoted very largely to other subjects, chiefly the possibility of tuberculous infection through pulp cavities as a cause of tuberculous adenitis and also to adenitis which may complicate scarlatine and the relation of this type to the banal forms of adenitis; since in each case the *streptococcus pyogenes* plays the chief role.

Free Skin Grafting in the Mouth. Eby, Journal of the National Dental Association, July, 1920, vii, No. 7.

The literature of free skin grafting is very large, but not until the requirements during the great war for maxillo-facial surgery did the subject become fully practicable. One of the most valuable contributions is the inlay of epithelium for the prevention of recurrence, shrinkage, etc., and to restore the full depth of the buccal and labial sulci. The advantages gained by this operation are liberation of tissues to make possible plastic operations, restoration of function to the muscles of expression, improvement of facial expression, prosthetic replacement of lost tissues, opportunity for the insertion of dentures, closure of perforations, liberation of lingual adhesions, lengthening of the lips, relief of trismus. Under intervention there are the preliminary steps, the operation proper and the postoperative treatment. There should be an interval of several months after healing and the parts should be free from all infection. The grafted skin must be clamped securely against the raw surfaces to be covered. Temporary prosthesis is used and the author recommends a head cap for the upper jaw and a chin cap and Jackson spring clasp for the lower jaw, but the entire details of preliminary and other procedures are much too long for summing up. In operating intrapharyngeal general anesthesia is usually necessary. The graft should be taken from the upper arm or thigh and should be of the typical Thiersch type. The work should be done with all speed and with an assistant and, naturally, the strictest asepsis. The grafts are to be supported by moulds and these are held in place by the devices already mentioned. These are not to be removed until the fifth day and after spraying, and the use of iodine, they are to be at once replaced until the insertion of permanent dentures.

Dental Surgery and Organic Heart Disease. P. J. Calvy. Journal American Medical Association, 1920, lxxiv, No. 18, p. 1221.

The author calls attention to the serious risk attending radical dentistry by extraction, in the presence of organic disease of the heart. A reaction may follow the removal of the infectious focus, and in consequence an existing chronic trouble may undergo exacerbation, or an acute attack may originate. In the case of a woman 42 years of age, with precordial pain and irregular heart action, extraction of the third lower left molar and several bicuspid on account of abscess, resulted in aggravation of the heart trouble, in the form of a systolic mitral murmur, slight dilatation and an intermittent action. The

operation left the patient very weak, and she was obliged to remain in bed for two weeks, under treatment directed to the condition of her heart. In the case of another woman, aged 64 years, the extraction of two lower second bicuspid led indirectly to death from dilatation of the heart, at the end of the third day. This patient was known to have hypertrophy of the heart, the systolic blood pressure being 140 and the diastolic 110. The mitral murmur which was present became more audible after the extraction, and the systolic blood pressure began to fall, while the pulse rate and general weakness progressively increased. In commenting upon these observations, the author points out that other and as typical cases, called from private practice and from the records of St. Agnes' Hospital, show severe cardiac reactions to have occurred after the extraction of infected teeth. Caution is especially indicated in older persons in whom the myocardium is degenerated, accompanied by valvular diseases, when the energy index is low and cardiac decompensation is imminent.

A Case of Mikulicz's Disease. S. G. Askey. *The Lancet*, London, 1920, ii, p. 502.

This condition is described as a swelling of the lacrimal, and usually also of the salivary glands, in consequence of an infiltration of and replacement of the normal gland structure by lymphoid tissue. The patient observed by the author was a man twenty-eight years of age, who came under his care in India, with chronic amebic dysentery. The parotid glands were greatly enlarged, of uniformly tough consistency, and not tender. The lacrimal glands were about twice their normal size. There was also some enlargement of the submaxillary and sublingual glands. Although slowly progressive, the glandular enlargement is in no sense malignant, and the author has seen one case of fifteen years' duration. The patient referred to above had noticed his face gradually increasing in width, for about three years. The etiology of the disease is unknown, and this peculiar symmetrical involvement of the lacrimal and salivary glands has been variously ascribed to a general infection, a local infection, or a primary neoplasmosis. Treatment, including x-rays, is unsatisfactory.

Side-effect of X-rays. K. Jalowicz. *Zahntechnische Rundschau*, 1920, xxix, No. 34, p. 395.

Although it is a well-known fact that the x-rays may give rise to undesirable associated phenomena, the occurrence of regular gingivitis following radiation of the face has not yet been described, to the author's knowledge. As a sequel of x-ray treatment for the purpose of removing a hairy growth from the face, a painful edematous swelling of both sides of the face made its appearance soon after the radiation. The submaxillary glands were likewise bilaterally enlarged, and swallowing disturbances developed which considerably interfered with the patient's general condition. These symptoms progressed until the climax was reached on the sixth day, when they gradually diminished, and on the tenth day a painful gingivitis became established. The gums were reddened, swollen, and softened; the papillæ were changed and prominent. By means of the customary medical agents for inflammatory processes in the mouth, a cure

could be accomplished after four days, so that on the fifteenth day after the radiation, all the troublesome associated phenomena had disappeared together with the hypertrichosis of the face.

Remote Results in Three Cases of Bone-Graft of the Lower Jaw. Juliard. *Schweizerische Medical Wochenschrift*, 1920, No. 25, p. 492.

The author reports three observations on bone-grafts dating back eighteen months or longer. These operations were performed in Germany, on French prisoners, by experienced surgeons and even by specialists, under the best clinical conditions, but the results serve to show that this method, which by many is considered as the best at our disposal, still leaves much to be desired. Reexamination of three soldiers, 23, 21, and 32 years of age, respectively, at the end of one year and a half to two years, showed that bone grafts of the lower jaw at any rate, do not always permit sufficient guarantees of solidity. Bony apposition is absent; there is no augmentation of the transplanted tissue. The old bone should have disappeared and been replaced by new bone, but at the end of eighteen months and two years, this process had not been terminated in grafts a few centimeters in length. No matter if the graft be supported by an apparatus or exposed to regional stimulation through strain, rarefaction sets in and mobilization takes place at one of its extremities. However, these observations are not yet sufficiently numerous to permit general conclusions unfavorable to bone grafts, and other results, in other regions of the body, must still be waited for. An improvement on bone-grafting may perhaps be found in osteo-periosteal grafts, which yield excellent immediate results, but the remote and permanent results of which still remain to be established. The application of this method is easy, the affected region promptly consolidates, and a resistant mass is formed; the callus is soft at first, but then becomes hard and demonstrable by radiography. The osteo-periosteal graft method has been repeatedly adopted by the author in his recent practice, so far with highly favorable results.

Adenoma of the Velum of the Palate. Portmann. *Bulletins de La Societe Anatomique de Paris*, 1920, No. 2.

Glandular tumors of the palatine velum are among the rarest benign growths met with in this region. The author was recently enabled to observe an illustrative case in a woman 45 years of age, who had noticed the presence of a small tumor on the right side of the palate, for about five months past. This tumor had progressively enlarged, up to the size of an apricot pit, but without producing important functional disturbances. The growth protruded into the mouth and pharynx, its indistinct borders vanishing in the healthy adjacent tissues. The mucosa was raised, but smooth and fairly even on its surface, without a change in color. There was no glandular enlargement. The tumor was removed under local anesthesia, and proved to be very adherent to the deeper layers. Immediate suture was applied, and normal cicatrization followed. On microscopic examination, the tumor was found to consist of hyperplastic epithelial glandular tissue; it represented a series of acinous glands much richer in secretory culdesacs than seen in the normal structure of the glandular apparatus of the palatine velum. The acini were generally larger than in the normal condition.

The connective tissue strands were arranged in a very loose-meshed network, and not extensively developed. Numerous small cells could be seen around the vessels and massed in foci. The tumor accordingly answered the description of a typical adenoma of the velum of the palate. Clinical examination permits no distinct differentiation between adenoma, adenosarcoma, or even sarcoma, although one or the other of these affections may be suggested by the configuration, consistence, or the condition of the mucosa. Histologic examination alone removes all doubts and usually shows the presence of a mixed tumor. A pure adenoma of the palatine velum is of exceptional occurrence, and for this reason the above case is worthy of report.

Pathology and Treatment of Diseases of the Peridental Membrane. Black. Dental Cosmos, July, 1920, lxii, No. 7.

For the past fifty years dentists have been on the wrong track because of ignorance of histopathology. Deposits of salivary calculus are not responsible for pus pockets and only serumal calculus below the free margin is to be thought of in this connection. Deposits of serumal calculus on the cementum are the result and not the cause of pus pockets. In addition to the cause just given frequent and continued irritations are responsible for much inflammation of the gums. When the peridental membrane is detached from the cementum such detachment is permanent. The treatment of today of removing deposit and applying medicaments is inefficacious in the management of established pockets. Simply surgical removal of the tissue forming the pocket is a more rational and efficacious method. In the future we must work chiefly along preventive lines. Successive removal of salivary calculus leads to a vicious circle in which more extensive deposit always follows until finally removal is followed by loosening of the tooth. Proper use of the toothbrush will prevent these deposits. Areas of affected gum require as much care as cavities in the teeth. Since 1912 the author has examined hundreds of specimens of gingival tissue, such as the walls of pus pockets and he believes that the true nature of these pockets can now be appreciated. It is not necessary for the gingival tissue to be diseased to sacrifice it, for the peridental membrane having been destroyed, the pocket cannot heal until this wall is eliminated.

Home Prophylaxis for the Prevention of Pyorrhea and Decay. J. L. Kelly. Long Island Medical Journal, 1920, xiv, No. 6, p. 288.

The author emphasizes that the cleaning of the mouth and the polishing of the teeth has been found to be the only effective treatment of pyorrhea and decay, or their prevention. In his opinion, dental hygienists (who at present are allowed to practice only in the office of a dentist) should be free to do their work, like manicurists and hairdressers. The energy of dentists is still bent upon reparative and constructive work, and the present habit of two or three polishings a year by the dentists is injurious rather than beneficial. Two or three yearly polishings lacerate and irritate the mucous membrane, which on the contrary should be stimulated by daily massage and weekly polishing. Patients should be taught to care for their own teeth. Massage of the gums

with an instrument that will not lacerate or puncture them, as does the tooth brush, is absolutely essential to their health, while nothing but friction with a smooth, hard substance, as for instance a flat wooden stick sloped like a miniature shovel will keep the tooth surface free from deposits. The toothbrush does neither of these. The author has successfully taught hundreds of his patients to clean and polish their own teeth, first instructing them to throw away their toothbrushes and to use sterile gauze wrapped around the finger for massaging the gums, as well as small orange wood sticks for polishing the teeth. He finally developed an instrument for massaging the gums and a polisher for polishing the teeth. The instrument for massaging the gums holds two sterilized rolls of cotton, and has a loop end for scraping the tongue; it is called the "Kuroris" (cura oris, care of the mouth). After the patient has learned how to clean his mouth with the Kuroris, he is taught how to polish his teeth. The polishing is done with a simple instrument, consisting of a handle carrying a wooden stick at either end. These wooden sticks are dipped into an antiseptic solution, and then into a polishing powder. Each tooth is polished separately, principally where the deposit of foreign matter has been rendered visible by means of the application of a disclosing stain which reveals the plaques. If the public would learn the true value of the care and cleanliness of the mouth and teeth, much of the suffering now experienced would be eliminated.

There are three reasons why the toothbrush should not be used, any one of which is sufficient reason for discarding it. (1) The brush does not clean the mouth, neither does it polish the teeth. (2) It cannot be sterilized unless it is boiled at least twenty minutes. (3) The brush cuts the teeth and gums if persistently used. The author's experience has led him to the conviction that the toothbrush is a distinct menace to health, perhaps even to life itself. It is the actual cause of thousands of cases of oral infection, the inoculator of multitudes of pyorrheal conditions. He is bitterly opposed to the toothbrush, which he describes as archaic, obsolete, and a relic of the dark ages.

The Causative Relation Between Febrile Conditions and Eruption of Teeth.

H. Abels. Wiener Klinische Wochenschrift, 1920, xxxiii, No. 44, p. 959.

Upon the basis of a series of observations from the ambulant material of the Caroline Children's Hospital in Vienna, the author protests against the still popular assumption according to which all sorts of acute diseases can be produced through the eruption of teeth out of the alveolus and the gums. Various factors are held responsible as intermediate links, such as forcible separation of the alveolar margins, traction on the gums and the regional nerves, gingival irritation with subsequent inflammation and sialorrhea, leading in their turn to diarrhea or other disturbances. Although the explanation of the injurious process varies greatly, the actual existence of a connection between the eruption of teeth and children's diseases is asserted as a fact, not only by the laity, but also in a somewhat modified form, by members of the medical profession. The so-called "anti-dentitionists" claim on the other hand that this belief in the pathogenic effect of teething is rather due to imperfect knowledge of the actual disease, and that dentition is an absolutely

physiologic process, incapable of giving rise to pathologic phenomena. But it is undoubtedly true that the eruption of teeth is often associated with cough, fever, diarrhea, or other acute disturbances, and evidently hastened also in the presence of febrile states. In all probability, in analogy with the effect of infectious diseases on growing bone, the matrix of unerupted teeth is stimulated by the microorganisms in the circulating blood and their toxins. Serial observations on nineteen cases of measles, in children under two years of age, showed an extraordinary increase of erupted teeth during the time of the febrile attack and immediately afterwards. The accelerating effect of severe and prolonged fever strikingly manifested itself in the eruption of teeth which were due in an approximate period of ten weeks, for the most part in the first four weeks. Infections of the influenza-group are undoubtedly capable of causing the same chronologic mode of distribution of dental eruptions as the author was enabled to demonstrate in measles and their sequelæ. Children with a tendency to "catch cold," who are attacked by such infections about every two to three months, will presumably get the larger portion of their teeth precisely during or immediately after a time of coughing and sneezing. The author's clinical material plainly showed a temporary and causative connection between febrile conditions and teething; but this coincidence of new teeth with acute infections must not be interpreted in such a way that the teeth are the causative agents of the disease. The inflammatory or at least hyperemic, congested condition of the buccal mucosa, which in children accompanies practically all febrile conditions, especially those of prolonged duration, probably plays an important part in this connection.

The Canalicular System of the Dentin. E. Urbantschitsch. *Wiener Vierteljahrsschrift für Zahnheilkunde*, 1920, No. 1.

The dentin is known to consist of the ground-substance and the dentin-channels or tubules. This tubular formation of the dentin has been described as far back as the seventeenth century. The author investigated the canalicular system of the dentin, basing his histologic studies on sections of teeth which had been stained according to Schmorl's method of bone-staining. The main channels or trunk-tubules show a certain symmetry in regard to their situation and direction. Secondary branches of the dentin-tubules are also encountered, which are interpreted by the author as anastomoses of the dentin-canalliculi with each other. He was furthermore enabled to observe continuations of the dentin-channels beyond the enamel and dentin boundary, as well as club-shaped thickenings of the end of the dentin canaliculi. His observations may be summarized as follows: The dentin possesses an abundant canalicular system, which communicates with the enamel and the cement. In youthful teeth, the ramification of the dentin tubules is equally abundant in the crown as in the root. The teeth of older individuals are not very suitable for the study of the lateral branches of the dentin canaliculi, probably on account of the diminution in the caliber of the channels with advancing age.

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EDITORIALS

Specialties in the Dental Profession

IN THIS issue of the Journal is an article entitled, "The Relation of the General Practitioner to the Specialist in Dentistry." It is taken from *Oral Health*, December, 1920, and is a résumé of an address by Dr. A. W. Thornton, Dean of the Dental Faculty, McGill University, and prepared for publication by Major W. R. Green. We regret that the full address was not published, but presume what we have represents the views of Dr. Thornton as given before the Ottawa Dental Society. This address contains many thoughts that will bear considerable study and review. Some of the reasons given for several of the specialties in dentistry have been more correctly summed up than some men will be willing to admit.

We have often thought, and have several times come in contact with the fact, that men desire to enter into a specialty because they believe it a

better field for making money. Each year we have applicants for postgraduate work in orthodontia who admit they are going into orthodontia because they believe it offers a better field for financial opportunities than does general practice. It is needless to say that such students are discouraged, because we do not believe they have the proper view to become a credit to the profession, and we do not want them as students.

The financial opportunities have been the principal reason so many x-ray laboratories have come into existence. The majority of those laboratories are conducted by men who have no dental training. They have no idea of improving the standards of dentistry as they have only been technicians or x-ray salesmen, and are attracted to radiography purely from a monetary standpoint. We do not condemn a man because he is anxious to advance in the commercial world, but we do not think it is good for a profession to have men in it who have no ideals except those that can be measured by dollars.

Dr. Thornton also calls attention to the fact that in his opinion there are but two subjects that can be made specialties of dentistry; viz., orthodontia and oral surgery. With this view we are in accord. We also believe that these subjects require a particular line of technical training that is different from the requirements in other dental branches. Orthodontia was the first specialty that stood out to such an extent as to attract attention. This was principally due to the fact that Dr. Angle organized a special course of instruction for those who wished to specialize. If it had not been for this advance in the teaching of the subject, orthodontia would have been greatly retarded in taking its place among the specialties. It is true some have devoted their entire time to the practice of orthodontia without any special postgraduate training, but they are in the minority.

With the definite progress which postgraduate teaching of orthodontia has made since 1900, we are compelled to disagree with Dr. Thornton when he states that only those who have had years of experience in general practice should take up the specialty of orthodontia. Experience has proved that the greater number of successful practitioners of orthodontia are found among those who have had but a year or less of general practice. We find some men who have given considerable time to the practice of dentistry before going into orthodontia, but they are in the minority. In fact it has been found quite difficult for the older men to grasp the instruction that is given in postgraduate work; this was so true that at one time Dr. Angle made a ruling not to accept men who had practiced general dentistry more than a few years. The arguments that a man must have a number of years' experience before taking up a specialty might have some weight if it were not for the fact that with the present educational requirements for entrance to a dental school and the four years of dental training, a student has spent sufficient time to obtain a good view of general dentistry. During his years of dental training, he will have seen a variety of conditions in the clinic, which gives him sufficient foundation upon which to build his specialty.

It seems to be a waste of time for any student of dentistry or medicine

to spend a number of years in the practice of something he does not expect to follow. With the present system of dental education, a student cannot afford to spend any more time than is necessary before he specializes. After he has finished his college course and has decided that he is going to specialize, he should immediately begin the study of that subject in the most approved way, so that he will be prepared to render some return to society before he is an old man. It is a waste of time and energy to compel a man to practice a number of years before allowing him to take up a specialty.

The oral surgeons of the future will no doubt be men who have had both medical and dental training if they are to give the specialty the standing it should have. Up to the present time postgraduate teaching in oral surgery has not made the advances that it has in orthodontia. This may be because methods have not been standardized, the literature is not in good shape and societies of oral surgeons have not been organized. Such courses in oral surgery as have been offered have not been satisfactory. With the knowledge gained by a few men who did actual oral surgery during the war, it should be possible to so standardize different methods that oral surgery may be more successfully taught than it has been in the past. We look for much progress in this specialty during the next few years.

There may be too much of a tendency for specialties to spring up among the dental and medical professions, but regardless of that evil, we believe the public is receiving better service because of specializing, and if that is true, a good purpose has been accomplished.

Are the Specialists in Orthodontia Derelict in Their Duty Toward the Dental Profession?

THE year 1921 appears upon the shifting scenes of time at a period when never before in its history, has the practice of dentistry been more attractive and interesting nor has it ever made history and advancement with such rapid strides, as at this time.

The dental profession is fairly clamoring for information and advancement in all of the various departments of dentistry, eager to learn, ambitious to be "up to the minute" and the field is being more and more divided into specialties. Orthodontia, at one time standing alone as a specialty in dentistry, does not now enjoy this distinction; on the other hand it has become only one of the many departments which may be specialized, or may be practiced in conjunction with general work.

The above is all evidenced by the enrollments in the study clubs of our large cities, many of them having a long waiting list, men fairly standing in line, as it were, to procure modern instruction in conductive anesthesia, removable crown and bridge, prosthesis, as well as many other subjects which seem to be popular at this time.

Now to the point. How many waiting lines have we seen clamoring for instruction in orthodontia? How many postgraduate courses or study clubs ever offer instruction in orthodontia at this time?

You say there is not the demand for this instruction; but why, then, is there not sufficient demand? Is it because the dental profession is being taught what little orthodontia it feels it requires for the most part in general practice, by spectacular advertising, propaganda calling attention to some particular type of appliance and the almost incredible and none-the-less impossible things which it will do all by itself if once set in motion?

Appliances are being advertised and claims made for them which are no less ludicrous to the trained man in orthodontia, than is the traditional cotton root canal filling, to the trained root canal man of today.

One appliance manufacturer, in exploiting the dental profession upon this subject, has addressed personal letters to members of state dental organizations, immediately subsequent to the state meeting, advising them with deep regret, that other duties prevented him from being able to attend the recent meeting and appear on the program to demonstrate his appliance before the organization, and so on and so forth.

Of course, all of this is amusing, to say the least; but, at the same time, this kind of propaganda is possible only because there is less actual information possessed by the general practitioner on the subject and methods of modern orthodontia than on any other branch of dentistry, hence misinformation is accepted by some as a substitute.

There is still another angle to the situation. The dentist many times starts a case of malocclusion because of his location. He may have no one to whom to refer his case. Lacking a thorough knowledge of orthodontia, he is looking for a short cut. He prefers to compromise and he excuses himself under the very popular delusion that the public is not willing to compensate him properly for highly specialized work. In this assumption, the dentist is entirely and grossly wrong, for as a matter of fact there is no better or more highly paid department of dentistry than the treatment of malocclusion. The compensation feature will not "hold water." If the dentist fails to be properly compensated for this work, it is either because he is unable to prove his case, or because he is not in a position to deliver results in orthodontia. Any individual who can afford an automobile all the way from a Ford to a Pierce Arrow can well afford and will arrange to have his children's mouths properly treated if the dentist is able to obtain results. Again, there is no more delightful or interesting work in the practice of dentistry, than that of orthodontia when practiced by modern methods.

There are many men who can promptly give the last word in conductive anesthesia, prosthesis, root canal technic, exodontia, or in fact any of the various specialties of dentistry, who will frankly admit that they know nothing about orthodontia, and rather pride themselves in knowing so little of the subject.

The fundamental principles of orthodontia and modern mechanical technic are badly needed by practically all men who have not been fortunate enough to secure special training. In turn, the public is badly in need of more orthodontists or at least more men who really understand the subject sufficiently to do good work for their patients.

Again, we ask are the specialists derelict in their full duty to the dental profession in not making determined efforts to advance this specialty among the general practitioners and to dispense information to those who seek the truth, that being the real object of true science? There is a great tendency among orthodontists to take the view that it is useless to give papers or clinics before dental societies and this is proved by the fact that some specialists have stated that they would not give an orthodontic paper before a dental society. This is an attitude that will not do the dental profession any good and allows misinformation to take the place of proper instruction. Papers should be given before the dental societies, which will enlighten the dentist as to the possibilities of modern orthodontia and teach him enough of the mechanical principles so that he will not be the prey of every misleading appliance advertisement that may come before him. Clinics should be given featuring what can be done in given cases and the design of modern appliances demonstrated. By giving such instruction the specialists will be doing a good work for the dental profession and the public, as well as supplying a new impetus to the advancement of orthodontia as a science.

—H. C. P.

ORTHODONTIC NEWS AND NOTES

The editors desire to make this department a permanent feature of the *Journal*, but in order to do so must have the full support of the orthodontic profession throughout the country. We would deem it a great favor if our subscribers and readers would send in such announcements as might be of interest to the profession.

Alumni Society of the Dewey School of Orthodontia

The next annual meeting of this Society will be held on April 25th and 26th at the Hotel Ambassador in Atlantic City. The usual high standard of the meetings of this society will be maintained. Clinics and evening sessions will be included in the program. All interested in Orthodontia are cordially invited to attend these meetings.

GEORGE F. BURKE, Sec'y.
741-43 David Whitney Bldg., Detroit, Mich.

The British Society for the Study of Orthodontics

An ordinary meeting of the Society was held at 11, Chandos Street, Cavendish Square, W., on Monday, October 18th, 1920, Mr. G. C. Campion, President, in the chair.

The minutes of the last meeting were read and confirmed.

Several new members were welcomed by the President, and formally admitted to membership.

Mr. A. Garrow, L.D.S., Edin., of 29, Queen Anne Street, W.1., was ballotted for and elected.

Mr. W. Warwick James explained the construction of an improved anti-mouth-breathing valve.

Notes of Interest

Dr. Albert H. Ketcham introduces his associates in the exclusive practice of orthodontia, Dr. William R. Humphrey, Dr. Hays N. Nance, and Dr. Albert E. Voss, 725 Mack Building, Denver, Colorado.

Dr. C. H. Juvet has removed his office to Suite 512, Jackson Building, Ottawa, Canada. Practice limited to orthodontia.

Dr. Harry A. Holder is opening his offices, 504-506 Jackson Building, Nashville, Tennessee, for the practice of orthodontia exclusively.

Dr. Harry G. Jones has opened offices at 320 Pennway Building, Indianapolis, Ind., and will practice orthodontia exclusively.

After March first, Dr. R. W. Noland will limit his practice to orthodontia. Office removed to 626 Fleming Building, Des Moines, Iowa.